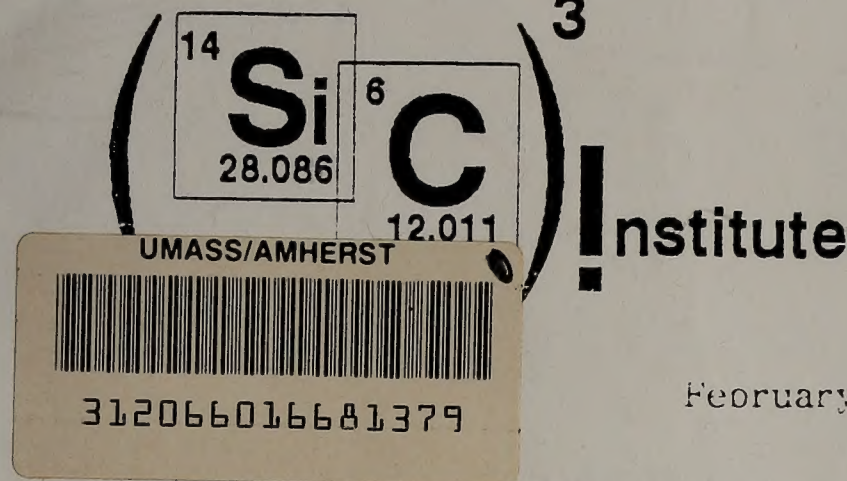


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The South Coastal Institute
a SCIENCE+Math Charter School
Tel./Fax (617) 472-4498

February 14, 1994

The Honorable Piedad Robertson
Secretary of Education
Statehouse
Boston, MA

GOVERNMENT DOCUMENTS
COLLECTION
JUN 08 1994
University of Massachusetts
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Dear Secretary Robertson:

The Founding Coalition of the South Coastal Institute, a Charter School for Science and Mathematics (SCI C.S.) is pleased to submit our charter school proposal for your consideration.

The Founding Coalition consists of parents, certified and other professional teachers, businesspeople, and other individuals with special interest in charter schools, who reside in Quincy or other communities of the South Shore. We believe that one important way to bring about improvement in public school teaching of science and mathematics is to dedicate schools to this purpose as we are proposing here.

The three founders who coordinated and wrote this proposal, Mr. Peter Burleigh, Dr. Susan E. Campbell, and Dr. Edward Fitzgerald, have presented their ideas and this proposal to Quincy Major James Sheets, Superintendent of Schools Mr. Eugene Creedon, Quincy Public Schools Information Director Mr. Arthur Woodward, and Quincy College President Dr. Donald Young. Mayor Sheets and Superintendent Creedon have both agreed to write a letter to you that reflects these conferences stating their view that ideas such as we have presented are powerful tools of change that should not be thwarted. They find the lack of state funding for charter schools to be problematical, and are not pleased that the funding burden will be borne by local school districts.

As you consider our proposal, please feel free to contact us regarding any further information or questions you may have. We will be happy to meet with your staff should that be helpful. We view our school as a work in progress which will continue to evolve.

We are proud to present our vision of public education in Quincy, as the South Coastal Institute, a Charter School for Science and Mathematics.

Sincerely,

Mr. Peter Burleigh

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supportive environment. We peer cautiously around the corner into a large room. 15 white robed persons are kicking large square objects in unison and shouting as loud as they can. Then, the karate instructor appears among the group. She says simply and calmly, "Please step back to the line and take your positions." The room is suddenly quiet and still.

Continuing on down the hallway, searching for the main office, only rooms with equipment, books, and computers at the perimeter, and large tables at the center, cluttered with assortments of tools, papers, and books, come into view. One room is occupied by a group of girls and boys who seem actively engaged in building a wooden structure. Some hammer boisterously, others pore over blueprints and columns of numbers. No one notices our presence. Finally, I tap a young woman on the shoulder and politely ask "Where is the main office and the principal?." The girl puts down her hammer and looks at me quizzically. "The who?" she asks. "You, know, the man that runs this place?" we insist. "Oh, you must mean Susan, she's acting Headmaster today. You can probably find her in the office." "But, we didn't see any office," I say. A boy interrupts, "She's not upstairs today. She's taken the marsh baseline study group out to Black's Creek to check Eh, and pH before the tide comes in."

"What can we do to help you?," the boy asks. I begin again, "We came to get information about your admissions procedures. By the way, this is the South Coastal Institute Charter School isn't it?" "Of course, you came to the right place. Our part-time admissions director is here on Monday, and Wednesday mornings, and on Friday evenings to accommodate parents' schedules, as soon as he is finished with his Shakespeare discussion group, that is. You can get him on interactive e-mail right now if you want, just go on over to that terminal and help yourself. If you prefer, there are some brochures on a counter at the end of the hall. You can leave your name and telephone numbers there, and someone will call you to set up an appointment." "Thanks for coming to see us," he said and turned back to his work. The teacher looks up briefly from his discussion with a student and waves as we leave.

On the way out, we overhear three students arguing about something. We stop to check, worried that there might be a problem. "Problem?" they say. "Have you heard the weather forecast? We only have three days left until our oral presentations of mastery have to be brought before our faculty panel for our level 2 promotion, and tomorrow there is supposed to be a Northeaster. We are arguing about whether to stay here and work this evening or go home to eat and then meet at our teacher's house." As we walk out the front door we realized that this is no ordinary public school.

Why is SCI C.S. needed?

It has been reported that "a mere 7% of 17 year old high school students can master the higher order thinking skills in science and

**A PROPOSAL FOR
ESTABLISHMENT OF THE
SOUTH COASTAL INSTITUTE
a Charter School
for Science and Mathematics**

February 14, 1994

EXECUTIVE SUMMARY

This proposal to found a charter school is submitted to the Secretary of Education for the Commonwealth of Massachusetts, Executive Office of Education by a group of interested, concerned parents, educators, and business people of the south coastal region of Massachusetts.

The South Coastal Institute, Charter School (SCI C.S.) curriculum centers on the trinity of science, mathematics, and humanities, each studied in the classical tradition of a college preparatory program. An emphasis upon mastery of all three separate fields of study, integrated through an innovative interdisciplinary program of study is expected to yield, cultural and historical as well as scientific and mathematical literacy in our graduates.

As we are located in a coastal community of southern Massachusetts our students are a part of a rich tradition of involvement with marine life and industry, a long and distinguished cultural history, and an associated public school system that has produced several national leaders in education. This school is designed to serve students in grades 7-12. The first year, there will be 60 students entering grades 7 and 8. Each subsequent year an additional grade will be added until we reach our expected capacity of 360 students.

The building is envisioned to consist of 8-9 classrooms, a resource center, some cubicles for individual study, and a large common room. The student to teacher ratio is expected to be 15:1.

A Visit to SCI. C.S.

We decided to visit the school today. At first glance, it seems to be a conventional public school. We see classrooms with students sitting at desks listening to and asking questions of a lecturer. Within seconds, though, it becomes apparent that a different atmosphere prevails here.

Several students of varying sizes waddle down the hall clad in hip boots, and slickers, carrying spading forks, buckets, jars, and small black boxes. They call out reminders to each other as they head out the door, teasing and giggling as they go.

At that moment someone screams "HI!". We can't imagine how that tone of voice could convey a welcome, or a warm

Faculty members are or have been practitioners as well as teachers in their fields. Their demonstrated ability, experience and strong interest to motivate others enliven their subject as they explore with their students and colleagues its breadth and depth, relating it to other disciplines and every day life.

The SCI C.S. is a community of learners. We believe a partnership between the teacher, student, parents and the community is necessary to promote learning. SCI C.S. incorporates a collaborative management style which engages all constituencies in decision making. The culture of this community is an important component in raising expectations and raising self-esteem. Such a culture provides a safe environment based on mutual trust and respect. We celebrate the joy of discovery, creativity, and serious accomplishment.

Parents or designated adult volunteer mentors are an essential part of this school community, and their participation is vital to its success. Parents or designated mentors attend conferences with teachers regularly and frequently, to remain informed about school activities and their child's progress, problems, and achievements.

Curriculum is developed by individual master teachers in accordance with the educational philosophy and mission of the institute, but is codified by consensus of the faculty. SCI S.C. will endeavor to retain linkage with the Quincy Public Schools curriculum to facilitate exchange of students, as well as with state and national guidelines to reflect, at minimum, their emerging standards of content and assessment.

Lesson plans are criterion-referenced. This facilitates efforts at developing and/or applying diagnostic and prescriptive tools to evaluate and assist individual students. Computer technology, with access to "the information superhighway" is an essential component of teaching, learning, and student and faculty evaluation.

Once the school is established, it will be governed by an elected 15-member board of directors. Its operation involves consensus among the membership which is comprised of faculty/administrators, parents, and committed community members. Student representatives participate in discussion at all stages.

SCI C.S. is an equal opportunity, affirmative action employer. Students will all be chosen without regard to their race, color, national origin, creed, sex, ethnicity, sexual orientation, mental or physical disability, age, ancestry, athletic performance, special need, proficiency in the English language, or academic achievement. We intend to attract and serve students from diverse backgrounds: those with few financial resources, those of diverse ethnic and cultural backgrounds, and all other interested people.

The SCI Charter School integrates aspects of classical and progressive approaches. In a sense there is a school within a school. One program uses the classical discipline-specific lecture/lab format, whereas the other connects and integrates different disciplines via small group and individual projects. Accordingly, there is both an expectation of traditional performance and a freeing, though carefully structured, research and development approach which fosters creativity in students and faculty. Students are grouped by mastery of individual subject

mathematics." America's labor force, meanwhile, needs to have higher level cognitive and problem-solving skills in order to compete in a global economy without lowering our standard of living. Estimates show that an average public school student has the potential to do 30% better on norm-referenced tests, if schools were substantially reformed.

A science and math oriented school would help raise the level of cognitive skills of students and create a climate where the student believes that science and math can be mastered and are part of everyday life.

We believe that SCI C.S. will provide leadership which will help the public schools develop new teaching methods and alternative assessment methods. We want our school to serve as a resource for research and development of new educational technologies to enhance education for all public school students.

We believe that a charter school will positively influence the local school system, by demonstrating that such innovative strategies can work, and that they can be implemented in a cost effective way. In addition the students who attend our school will benefit by having had the opportunity to succeed in a manner currently not available to them in the public school. For every student who can be helped by our school, our community and theirs will be better for it.

SCI C.S. is characterized by a spirit of open-mindedness to new ideas and the possibility of change for the better by learning, discovering, and applying this knowledge. It promotes a culture of merit. We cultivate an academic work-ethic, achieved through our core values of:

Self-paced learning
a spirit of Cooperation, and
independent Inquiry.

SCI C.S. provides a dependable, supportive, and nurturing structure to encourage independent thinkers to test their ideas.

The time each student devotes to each subject will be determined individually to achieve a balance of the five core subjects, taking into account those areas in which the individual student has deficits or excels.

A core curriculum involves five academic disciplines in the classical as well as the interdisciplinary programs: science, math, English, history and Spanish. A student may additionally pursue any topic of his or her interest within the interdisciplinary program, subject to agreement of the appropriate supervisory faculty. Computer literacy is a matter of course for students and faculty.

Teachers are empowered to run the school and to collaborate in a truly supportive and collegial atmosphere. The administration meets frequently with faculty and is comprised of faculty, involving them in all decisions which affect the educational environment of the school. Many duties and responsibilities such as admissions are delegated to members of the faculty.

In accordance with the 1993 Massachusetts School Reform act the founding coalition hereby submits our application to Piedad F. Robertson, Secretary of Education for the Commonwealth of Massachusetts, Executive Office of Education. The group consists of three original founders who initiated and coordinated the cooperative effort and wrote the proposal, an additional seven associates who critiqued and offered advice, and a number of parent and community supporters. Two of the ten members of the founding coalition are certified teachers in Massachusetts and nine are parents.

The founding coalition, herinafter referred to as the founders, propose the establishment of the THE SOUTH COASTAL INSTITUTE a Charter School for Science and Mathematics (SCI. C. S.). (M.G.L. Chapter 71, Section 89).

The SCI C.S. curriculum will center on science, mathematics, and humanities, each studied in the classical tradition of a college preparatory program. An emphasis upon mastery of all three separate fields of study, integrated through an innovative interdisciplinary program of study, is expected to yield cultural and historical as well as scientific and mathematical literacy in our graduates.

Massachusetts is investing in the future of the biotechnology industry assuming that it will be the growth industry of the next decade and beyond. Given the many world-class health centers in the metropolitan Boston area, our status as a mecca for research and development in the health fields is also expected to continue. Despite the current downturn in the computer industry, is still an important economic sector due to development of software.

The majority of graduates of SCI C.S. are expected either to seek out admission to area colleges and universities stressing these as major fields of study or to return here to their families and community for employment once they graduate with college degrees.

At SCI C.S. we plan to make our students comfortable accessing these higher institutions of learning and associated industries so they can explore at an early age and in a more direct way what it means to be a scientist. Then our students will understand why they may pursue further study and employment what this will require of them in time, effort, and dedication. This experience should also help them exercise more influence in and greater likelihood of achieving their own individual objectives of college admission or professional employment.

A coastal community of southern Massachusetts with a rich tradition of interaction with marine life and industry, a long and distinguished cultural history, and a public school system that has produced several national leaders in education and itself contributed in the past to national initiatives of educational reform, Quincy is within half an hour's commute by subway to Harvard and MIT. Quincy is a mere 15 minutes' commute from the Harbor campus of the University of Massachusetts with its coastal resource management program). We intend to access all of these resources into the curriculum.

The SCI C.S. Founders represent views of education that range from the "cutting-edge" of the American educational reform movement to the classical, traditional approach. Yet, we have found it easy to agree on

areas. Each proceeds at her or his own pace. Advancement is based on demonstration of mastery of minimum requirements. Achievement beyond the minimum is encouraged by a system of competitive rewards and recognition as well as by the mentoring approach of peers, faculty, and scientific and mathematical associates.

Applicants must accept the mission of the school and be willing to comply with the requirement for family participation. In the case of a motivated student whose parents are unwilling or unable to make commitments of participation such as we require, the student may apply for a waiver by substituting an acceptable adult mentor (e.g. another adult relative, a former school teacher, community volunteer, or designated service provider). Applicants declare themselves ready to support our ethics of work and mutual respect. Academic standards which determine eligibility will be established once faculty have been hired. These standards must be approved by the board. They are used to determine the likelihood of the applicant's success with the academic program being offered, but not to discriminate in any way. We wish to make SCI. C.S. universally accessible to all students, but we recognize that our program is clearly different, and that not all students may be able to flourish at SCI. C.S..

How will we know if SCI C.S. is doing its job?

Assessment of students in the classical program of the school employs criterion-referenced and norm-referenced tests, including all the usual test formats: multiple choice, matching, fill-in, essay, and oral, although additional means of assessment may also be used to test comprehension and retention of acquired information.

Assessment of students in the multi-disciplinary program of the school involves subjective and objective evaluation of group process, as well as of individual experiments and projects, through a consensus of two or more instructors. All means of documentation of results will be considered, including written, oral, or visual presentation, in the form of journals, portfolios, posters, etc. A panel of faculty representing the five core areas determines eligibility for graduation.

One of the advantages a charter school has is the accountability built in by the degree of support the community shows toward the school. Parents can "vote with their feet". Success will be measured by retention of students in SCI C.S., and the ability of the school to grow as planned, as well as to attract successful students and additional funding to further enhance its programs.

We propose to create a school that will not detract from, challenge or depreciate the value of dedicated public school educators, but rather a school that can provide options, and demonstrate the effectiveness of a community based school where parents, faculty and students are empowered to create a rigorous, responsive, and effective educational alternative.

INTRODUCTION

Motivated students will learn best when they are presented with high quality faculty offering an integrated and diverse program where each student is able to progress through the curriculum at his or her own pace. Learners achieve the most when they are allowed to progress at a rate appropriate for them, and that different students learn in different ways at different times. For these reasons we expect that students who are currently not able to succeed in the existing public schools most likely will flourish at SCI. C.S..

SCI. C.S. expects students' families to be actively committed to their children's education. This commitment will be expressed in the form of a contract. Students and their families agree to support the mission and philosophy, and participate as volunteers and thus contribute positively to the school community. Parents will have an important role in the governance of SCI. C.S.

The one characteristic that all of the SCI C.S. founders share is an open-mindedness to new ideas and the possibility of change for the better by learning, discovering, and applying this knowledge. This is the spirit that we mean to communicate to our students and colleagues by modeling it in our every decision and activity, including their and our own evaluation.

Although we are proud of what we know and believe in what we can do, we also think that humility and the acceptance of correctly applied, constructive criticism is appropriate and desirable. We do not think that the "I'm ok, you're ok philosophy" has merit beyond the simple acceptance of another's right to exist and have opinions. As scientific and rational people we believe that there are fundamental truths whose interpretation is not subject to change by popular opinion. Accordingly, whenever discrepancies in evaluation of a student (or a teacher) appear, and especially when differing methods of evaluation are used to determine mastery or progress and such discrepancies become apparent, a team conference may be convened to review the matter and assist the teacher or the school in resolving which measure of performance is the best indicator in this specific case, whether additional methods of evaluation should be tried, or whether additional work is needed in an individual discipline or area of responsibility.

2.) SCHOOL OBJECTIVES

In each **subject area** there are fundamental skills, concepts, and knowledge **which** are necessary for a minimum competence. Learners do best when **the subject matter** is interconnected, and when it is made relevant to everyday experience and life goals.

the vision of this school and the content of this proposal. It is therefore, not surprising that our view of assessing students encompasses both the traditional as well as the innovative. We believe that SCI C.S. should be able to use both approaches well.

We propose to create a school that will not detract from, challenge or depreciate the value of dedicated public school educators, but rather a school that can provide options, and demonstrate the effectiveness of a community based school where parents, faculty and students are empowered to create a responsive and effective educational alternative.

By demonstrating that positive outcomes can be produced by a school with a different approach, we believe that we will strengthen the education for all students in our school system. School improvement should be accepted as a challenge, which has the potential to benefit all students and citizens in this city and neighboring towns.

PART I

1.) MISSION STATEMENT

SCI. C.S. is an innovative charter school as defined in the school reform act which provides a rigorous basic curriculum for students preparing to enter college upon graduation. SCI. C.S. is open to all students who feel that they can benefit from our alternative educational environment. SCI. C.S. wants to provide an opportunity for any student who wishes to prepare for entry to the college of their choice. The focus is on academics with an emphasis on math and science. SCI. C.S. is a serious academic institution based in an ethic of work and pursuit of a culture of merit.

SCI. C.S. believes that the school is a community of learners. We believe that in a partnership between teacher, student, parents and the community is necessary to promote learning. SCI. C.S. incorporates a collaborative management style which engages all constituencies in decision making. The culture of this community is an important component in raising expectations and raising self esteem. Such a culture provides a safe environment based on mutual trust and respect. We recognize that the process of improvement involves the whole person. We celebrate the joy of self discovery, creativity, and serious accomplishment.

SCI. C.S. affirms learning pedagogies which accommodate diverse learning styles, yet realizes that accountability, a positive learning environment, and high expectations must accompany the flexibility of alternative learning methodologies. Learners do best when they are expected to achieve at a high level. Both high standards and expectations should be applied to the performance of its students and faculty.

3. STATEMENT OF NEED:

National

In 1983 the U.S. Dept of Education published *A Nation at Risk* which was written by the National Commission on Excellence in Education. This widely recognized document claimed that "Our society and its educational institutions seem to have lost sight of the basic purposes of schooling, and of the high expectations and disciplined effort needed to attain them." The report cited several examples of "Indicators of Risk":

23 million American adults are functionally illiterate.

13% of all 17 year olds are also considered functionally illiterate.

SAT's demonstrate a virtually unbroken decline from 1963 to 1980.

There was a steady decline in science achievement scores of U.S. 17-year-olds as measured by national assessments of science.

Between 1975 and 1980, remedial mathematics courses in public 4 year colleges increased by 72%

Jacob Bristol reported 1989 that "A mere 7% of the 17 year old high school population can master the higher order thinking skills in science and mathematics and make correct inferences, and 41% have some detailed scientific knowledge and can evaluate the appropriateness of scientific procedures. In relation to mathematics, only 6% of the 17-year olds are capable of solving problems of a multi-step nature and use basic algebra." (*Connecticut and New Jersey*, Course 6621x01)

The National Education Longitudinal Study of 1988, found that eighth grade students in "independent schools" reported spending 7.6 fewer hours on average watching television than their counterparts in public schools. They also said they read 2.2 more hours per week, and spent 10.7 more hours each week doing homework. We conclude that lower expectations and standards result in less time on task, and reduced achievement.

Public education's reliance on standardized math and science contribute to the decline in student achievement "because they emphasize rote memorization skills instead of conceptual, hands-on abilities " and they promote "a very oppressive 'drill and kill' approach " that has "a negative impact on learning." according to George F. Madaus, (1992) director of the Boston College Center for the Study of Testing, Evaluation and Educational Policy. (Finding of a NSF study , *Boston Globe*, Oct. 1992).

An international science achievement study (National Research Council, 1989) reported that "U.S. Grade 9 students ranked 15th among the 16 countries whose data have been analyzed". Students wishing to major in mathematics have dropped 50% since 1975.

Industry and business leaders recognize that the future of the economy was related to the skill of the workers. If the U.S. is to compete in a global economy, then we need to provide a higher level of cognitive and problem skills in our labor force. With increased competition for simple labor from abroad who will accept much lower wages and living standards, the U.S. will need a much higher level of skills than ever before. ("Corporate Task Force on Education, Report", Union Carbide Corp. 1989).

In order for learning to occur there has to be a safe climate and a culture which fosters mutual respect as well as a love of learning. We believe in a culture of work and intellectual honesty, where all members of the community are life-long learners. Certain factual information is considered essential to basic education. Development of creative and critical thinking skills, high order thinking processes, and cooperation in the learning process go beyond mere memorization of facts. Students need to be able to solve problems by using analysis, extrapolation, and synthesis. They should be able to formulate their ideas and to present and explain them to others. They need to be able to evaluate critically and be able to make informed judgments. Accordingly, we believe that there are many ways for students to demonstrate their competence beyond the traditional testing methods used almost exclusively in existing public schools.

SCI. C.S. will make decisions about personnel, program structure, and rules for the institution so as to create a school climate of safety, collegiality, and common mission among its constituents. SCI. C.S. will encourage mutual respect among students, faculty, staff, and parents. All members of the school community will be expected to conduct themselves with courtesy for other members of the community at all times. Governance at all levels will be inclusive and collaborative. Decisions will be made with the broadest possible participation by those affected or involved in the outcomes. The ultimate authority for establishing policies of SCI. C.S. will be held by the board of directors as described in the section on governance.

In a culture of respect and mutual support all students who otherwise were timid or afraid to try what is commonly perceived as "difficult" subject matter, should find that they can be successful and reach a higher level of achievement as a result.

As discussed in recent studies (The AAUW Report, (1992) "How Schools Shortchange Girls), the smaller size and supportive environment of our school is expected to enhance opportunities for female students to reach higher levels of achievement in science and math than they do in conventional classrooms.

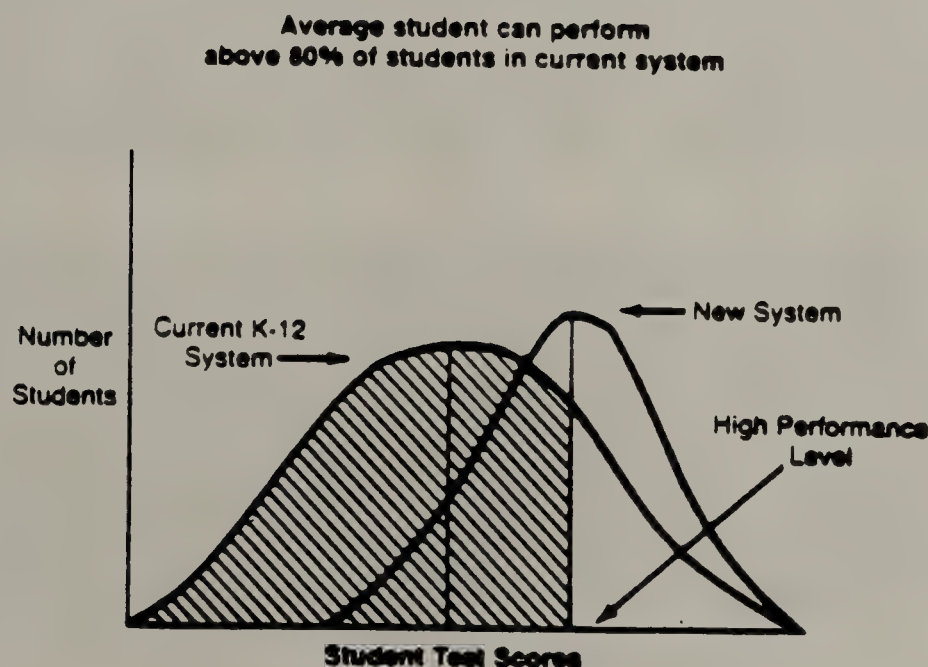
Various standards will be established within academic disciplines at progressive levels of difficulty. These standards will define the minimum acceptable mastery of skills, cognition, and content. Students will be periodically evaluated as to their progress or lack thereof and they will be able to work at the next level and eventually graduate, if they have **mastered** the standards so established. SCI. C.S. chooses to focus on the **core curriculum** and to extend the time on a limited set of tasks in order to do them very well. SCI. C.S. believes that motivation and commitment by students and their parents are essential components of a successful education: therefore any student not demonstrating reasonable progress or motivation, or who fails to cooperate with the mission, or who demonstrates a reluctance to support the ethics of work and mutual respect which are fundamental to the successful climate of SCI. C.S., may be asked to leave SCI. C.S. Specific procedures described in PART III, Code of Conduct will insure that any such decisions are done with the best interests of both the community of the school and the student in mind.

powerful of all arguments in our favor, because it shows how SCI. C.S. charter school can help the teachers and administrators of Quincy discover ways to change. We expect that these changes will support a philosophy of "self renewal" there by improving education for all the students in Quincy public schools.

We need our youth to be better prepared to compete in the global economic future we face. What will be the effect of better schools? A California Business Roundtable study estimates that the average student could do better than 80% of the students under current public educational systems (Paul Berman, et al., *Restructuring California Education: A Design for Public Education in the Twenty-First Century* 1988) The following graph illustrates their predictions (p. 141):

Graph 2, Expectations

MORE STUDENTS CAN LEARN MORE



Massachusetts

The Massachusetts Department of Education's development of Curriculum Frameworks program is expected to provide students the opportunity to:

- 1.) learn in an environment which acknowledges, respects, and accommodates the gender, background and learning style of the learner;
- 2.) demonstrate an understanding of math and science principles and processes and have the chance to work on project-based problem solving and group learning activities;
- 3.) appreciate math and science as tools to explore the unknown and discover new relationships and patterns in the

Robert Reich states, "A nation living beyond its means faces the same choice as a person doing so: grow poorer or become more productive." ("Must Economic Vigor Mean Making Do With Less?", *Creative Workforce*, Jan. 1989) He recognizes that work in the "Old economy" was centered around making greater value with less cost. Jobs were rigid and there was a clear hierarchy between management and worker in the "high volume, standardized production of goods." Our schools prepared youth well for this work environment.

However, "we can no longer expect to be competitive by simply producing more of the same thing we produced before, at lower cost." In the competitive global economy we will need to "Increase the value of labor rather than cut its costs." New systems of education will need to prepare our youth to collaborate (to join their skills), to think critically on the basis of experience, and to be able to invent and experiment to solve the problems of making high quality products. The worker will have to continue to learn and grow in their understanding of the continual change needed in tomorrow's work place.

During the 1980's school reform proponents pointed to lower SAT test scores and comparisons with foreign schools on performance tests. The debate centered on quality, but in 1990 George Bush convened the first summit of the U.S. Governors to discuss broad issues in education. The outcome has been an new initiative on the skills of the potential worker, setting performance goals, and a rethinking of what is important for our students to learn.

Recent studies of schools in China, Taiwan and Japan demonstrate by test results that "American students fail to perform at a level comparable to their peers in Asia." ("Learning from Asian Schools, Harold Stevenson, *Scientific American*, Dec. 1992) Surveys showed that American parents' view of the academic performance of their children was unrealistically much higher than their counterparts in Taipei and Sendai. It was also found that "teachers in Asia use concrete materials more frequently than American teachers." Paradoxically, U.S. school classrooms reflected more symptoms of stress than Asian schools. The article concludes that U. S. educators may be focusing more on the individual need of children than on the "process of teaching. " "The challenge in the U.S. is to create a greater cultural emphasis on education and academic success."

Albert Shanker who represents one of the largest collective bargaining units of teachers in the world and is a remarkable advocate of school reform says in an article in the Phi Delta Kappan (Jan. 1990) that "After more than six years of intensive effort, American public education is still at the edge of disaster." Shanker realizes that without change from within, the public schools will lose credibility resulting in the decline of the public system as we know it (John Chubb and Terry Moe, *Politics, Markets, and America's Schools*, 1989). He supports initiatives for change because he knows that it is in the long term best interests of dedicated teachers.

According to Shanker "public education is unusually resistant to change" which he credits to "a failure of imagination". "The bureaucratic nature of our system makes it impossible for our schools" to "have new visions"... "the capacity for responding to new challenges must itself be institutionalized." We believe that this is the most

Woodward, Information Director, QPS, these points were not new but actually a return to the concepts of the "Quincy Method" of Francis Parker developed in the previous century, but updated through the application of new learning theory, vocabulary, and computerization. The points were:

goals, behavioral projections (of what we expect students to become), rationale, concepts, objectives (general objectives and specific performance objectives), diagnostic and evaluative tools and procedures, learning activities (appropriate to the individual students learning styles, abilities, needs, and goals), appropriate media, management system (computerized), self-learning environment, all within the framework of a feedback and evaluation loop.

The SCLS system even envisioned an interdisciplinary approach to learning in which concepts common to one or more areas of learning or discipline, or that reinforced in one or more disciplines could be team taught or at least coordinated in their presentation. The Quincy High School auditorium was renovated to become the Method Center for these collaborative efforts of teachers and their students. The Method Center renovation was completed in 1973, but it was never used for the purpose intended. In 1993 the center was rededicated as the Louise DuArt auditorium for the performing arts, a change that appeared to signal the end of the system-wide effort at a uniform curriculum and an interdisciplinary approach.

Today, in the QPS there is substantial interest in the thematic approach to teaching, especially at the elementary level. This year QPS teacher Ann Peg, who pioneered this approach in Quincy, was selected for a Presidential award for excellence in the teaching of science. Ms. Peg allows students to discover scientific method and fact by providing them with questions, settings, and materials, but not with answers to learn. She is a risk taker who is beginning to reap rewards. The question is whether and how this approach may transfer to other teachers and other schools. There is no plan for this to happen. Similarly, other progressive projects and teachers have developed in Quincy, but none has had their programs widely accepted.

Yet, recent studies of the performance of students in the Quincy school system indicate that the MATH test scores exceed the National Mean by an average of 14.2 on the California Achievement Tests given in fourth, sixth, and eight grades over the past 6 years. The following chart presents the data from the Quincy School district.

world around them;

4.) think creatively and develop knowledge and skills that are needed to understand and succeed in our increasingly technological world.

The Massachusetts Department of Education. "Report on the Development of the Massachusetts Curriculum Frameworks in Mathematics and in Science & Technology" issued recently outlined the following problems:

- 1.) few students have insight and understanding of math procedure only 25% of 8th graders have mastered principles of the curriculum and can apply that knowledge
- 2.) 47% of 8th grade students and 62% of 12th graders think math is difficult
- 3.) significantly more boys than girls take science in high school
most curricula rely on drills in mathematics with little emphasis on higher order reasoning skills or applications
- 4.) schools use computers more for drill and practice than for learning activities

We believe that the SCI C.S. recruitment, curriculum, and methods of teaching and assessing students will be beneficial in addressing and helping to resolve these problems.

Quincy and the South Coastal Area

The Quincy Public Schools (QPS) Student Centered Learning System (SCLS) grew out of a late 1960's systems approach to management, curriculum development, and instructional process in Quincy as part of the national Educational Systems (ES '70) reform movement. The following goals emerged. The public schools need to provide society with individuals who are maximally competent as

- 1.) individuals
- 2.) citizens, &
- 3.) workers

The Process dimension involved: relevancy, individualization, use of technology, brought about and applied through the efforts of a highly developed staff.

In the early 1970's, a design for learning was developed called the Student Centered Learning System (SCLS). According to Arthur

During a Feb. 6, 1992 Workshop, participants were given a report entitled "Quincy Public Schools, Strategic Planning Project, Options Report" Draft G. The report presents a summary of results of two community surveys conducted by the consultants: The CO/OP. This report references Robert Reich and others who point out the changing skills that will be needed in our work force, and the low performance of American students as compared to international Scores in math and science as we stated above. More significantly, the results of the citizen survey reported that "88% agreed that mathematics and science should receive the same emphasis as English language arts." "76% supported an assessment process that would assure the achievement of at least minimal competencies, including problem solving, for all students."

Five of the options for improvement proposed in the report were:

- 1.) The need for a clear curriculum through all grade levels.
- 2.) "The curriculum should be based on the belief that all students can do challenging math and science."
- 3.) "Stress problem solving skills and application, analysis and synthesis."
- 4.) "Greater flexibility" in scheduling to allow "team teaching" and more communication among teachers.
- 5.) Use a "wide range of assessment strategies."

We believe that SCI C.S. will provide leadership which will help the public school in the development of new methods, alternative assessment methods, and the use of technology to enhance education for all public school students.

Another recommendation was that "An advanced mathematics and science program including the use of computer technology should be planned." We hope to design a summer program which will offer this to the South Shore Community. Should it be possible to provide such a program, we intend to charge tuition to help supplement our income.

The consultant's report was not followed up in any way that we can determine. What better reason can there be for the establishment of the SCI C. S. in Quincy?

We will make available at your request, a copy of "Quincy Public Schools, Strategic Planning Project, Options Report" Draft G. ("The QPS-Co/op Report")

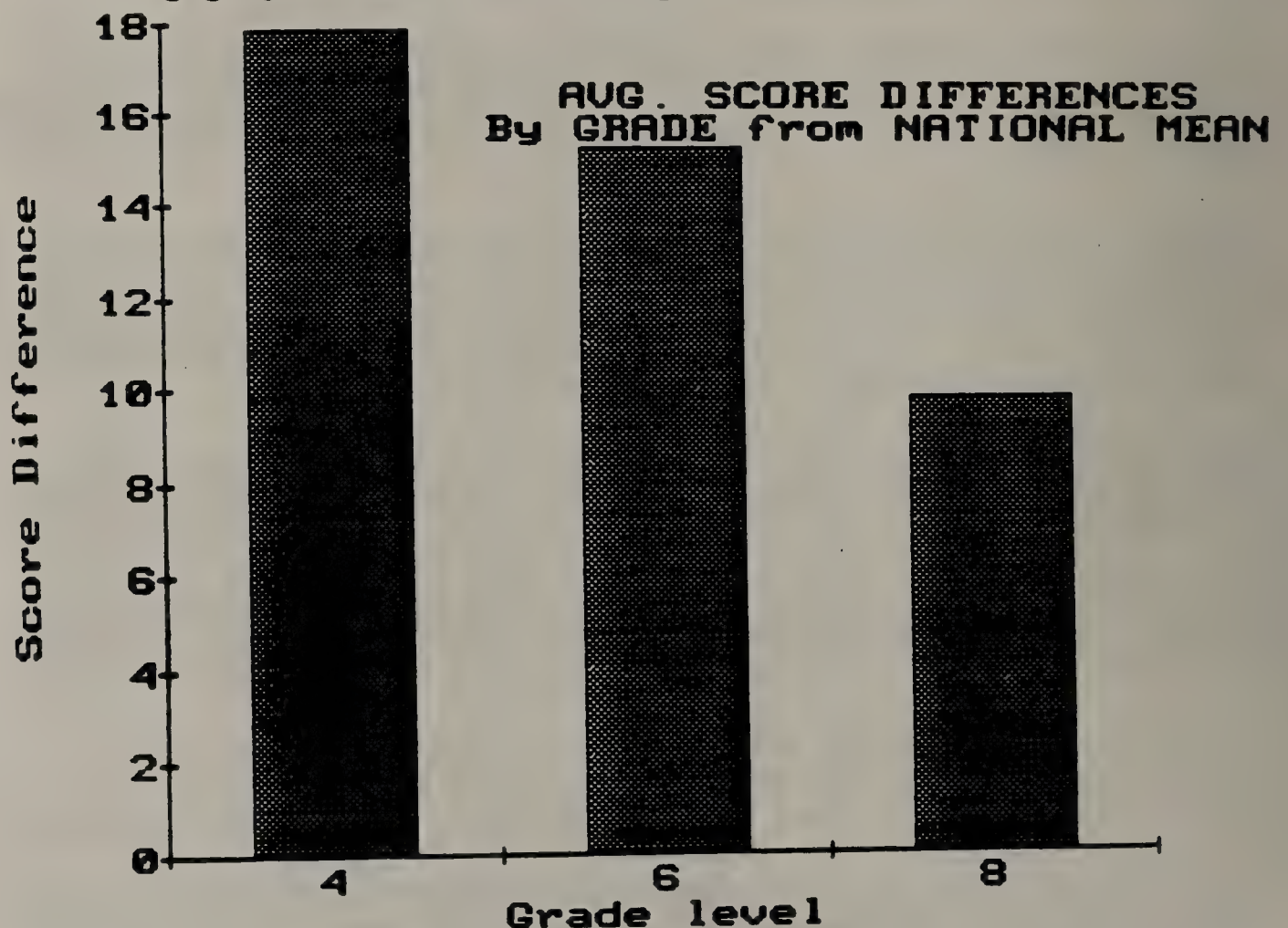
The main challenge to the establishment of charter schools is to demonstrate why they will benefit existing public schools in their communities. We believe that a charter school will positively influence the local school system, by demonstrating that such innovative strategies can work, and that they can be implemented in a cost effective way. We want our school to serve as a resource for research and development of new educational technologies. In addition the students who attend our school will benefit by having had the opportunity to succeed in a manner currently not available to them in

Table, Quincy CAT Math Scores

QUINCY MASSACHUSETTS
School District Average MATH Scores

Year	GRADE LEVEL			NATIONAL MEAN			DIFFERENTIALS		
	4	6	8	4	6	8	4	6	8
1988	697		770	688		763	9		7
1989	701	744	769	688	734	763	13	10	6
1990	706	750	771	688	734	763	18	16	8
1991	711		774	688		763	23		11
1992	709	752	776	688	734	763	21	18	13
1993	711	751	777	688	734	763	23	17	14
AVG.	705.8	749.3	772.8	688	734	763	17.83	15.25	9.833

When these results are viewed over time and each grade level is compared two important things stand out. 1. The point differentials have not improved as much in the last two years, and 2. The eighth grade students show an average differential which is 8 points LOWER than that achieved by the fourth graders. The sixth grade lies in the middle. The following graph illustrates these figures:



We feel that the data indicate that older students perform lower than the potential indicated by performance in the younger grades and that the Quincy Middle Schools offer a less challenging program with lower achievement levels than this system does for younger children.

SCI.C.S. incorporates these principles in its mission, philosophy, and program design. These principles are the ones upon which SCI C.S. was conceived and designed.

We respect the dedication of the QPS administrators, teachers, and the school committee to provide a quality education while also meeting the complex and demanding social need of the communities diverse population of students. As parents and educators who feel that the public schools in Quincy, could improve the options and choices available to the children, we are committed to the concept of establishing a school which will enhance and improve educational opportunity for all our young citizens as well as those of surrounding towns in the south coastal area.

4.) SCHOOL DEMOGRAPHICS

LOCATION

Our current plan is to locate SCI. C.S. in Quincy Massachusetts. However, we will accept students from surrounding towns. In establishing a charter school, the founders recognize the negative impact our school may have due to the removal of funds from the Quincy School District, but is our intent to demonstrate that innovative and alternative methodologies will be of great benefit to the school system. We recognize that Quincy has a history of leadership in school innovation beginning with Francis Parker, its first Superintendent of schools, and the major initiative of Student Centered Learning begun in 1973. The promotion of Quincy as an innovative and high quality community for families will be enhanced by its support of educational alternatives such as the SCI. C.S..

In addition it is our wish that SCI. C.S. become a source of inspiration and creativity in education and a place to demonstrate positive and helpful alternatives that will enhance public education. We welcome evaluation and collegial relationships with the Quincy School System. When we succeed we want to share the success with our public school colleagues, and to help them bring useful changes to their own schools. We also look forward to their objective evaluation and suggestions for improvement. We plan on becoming a partner in the joint enterprise of educating our youth for the new world economy.

The specific location of SCI. C.S. will have to be made on the availability of suitable space, but we have two major criteria that it be: 1. Near a MBTA station (Quincy has four on the Red Line); 2. centrally located with easy access to Rt. 128, or Rt. 3. A site near the current Quincy Adams station would meet these two criteria very well, and there are several vacant industrial spaces in this general vicinity. There are also several other vacant locations near the center of Quincy such as the old Patriot Ledger Building and the Grossmans building. A local area map is included in the appendix.

We feel very strongly that a charter school in Quincy would not be a challenge or detriment to the established educational professionals in our community or take away from their resources, but be a place of

the public school. For every student who can be helped by our school the community will be better for it.

The major strategies for improving schooling are clearly identified by the MA. Administrative office of Education its report on the results of the October conference 1993 as published by The Executive Office of Education "Charting: the Course: Public School Options for the 1990s". These strategies are corroborated by many sources including: TedSizer, Howard Gardner, Robert Sternberg, John Goodlad, John Chubb, Albert Shanker, The Carnegie Report, James Coleman, Dianne Ravitch, George Bush, Robert Reich etc. A summary produced from the current debate on educational reform and educational research includes the following key elements of effective schools. These objectives are:

- 1.) Establish school autonomy, empower teachers and administrators to make their own judgments and to practice their professionalism.
- 2.) Focus on learning. Competency means much more than recalling facts, it involves the use of creative and critical thinking and higher order cognitive skills such as analysis, synthesis, and evaluation.
- 3.) Recognize that Students learn in different ways at different times
- 4.) Mastery of essential skills may be demonstrated in a number of alternative ways which reflects the comprehensive nature of learning, the various learning styles and abilities possessed by our students.
- 5.) The school is a community. Members share a common value of mutual respect for each other and for learning. There is a focus on work and the expectation of commitment, trust, and courtesy from all members of the community.
- 6.) The program will be small and flexible, allowing for alternative methods of learning, and credit will be given for actual accomplishment and a demonstrated proficiency rather than the age or the amount of time the student spends on a subject.
- 7.) Increased parental involvement beyond that normally encouraged by public schools. Such involvement will contribute to the strength of the school.
- 8.) Inventiveness, and a spirit of entrepreneurship operates in order to try out alternatives in a cost effective manner.
- 9.) The willingness to evaluate effectiveness and to change are key components for success.

A specific recommendation of the QPS-Co/op report was to introduce "schools of choice for parents and students, and expanding the involvement of universities, businesses, community agencies, and senior citizens in schools and programs."

5.) RECRUITING & MARKETING PLAN:

The founders have begun to involve a wider constituency in our community in our plan to establish SCI C.S., but it is still too early to establish an accurate degree of interest among the Quincy parents in SCI. C.S. Several members of the founding group are engaged in the formation of a questionnaire which will be given to parents of students potentially able to apply for admission our the 7th and 8th grades. A recent study conducted by Quincy 2000 Corp. reported that 34% of the Quincy population recently surveyed said the schools were good, 10% felt they were excellent, and 18% felt that they were fair. 33% did not respond to that question. 400 people were polled in this phone survey.

Once we complete our study of community interest, we will design a complete set of admission materials which will present our school's mission and philosophy. At this time we will become publicly active, and we are certainly going to get local press coverage. There is a great deal of interest. We plan to actively pursue the local media and we will make ourselves available at public meetings.

One of the founders has extensive experience with independent school marketing, and it is planned for SCI C. S. to follow standard procedures such as open house, visiting schools, making presentations to parents, and sending out mailings.

A key part of marketing any product is to understand the "niche". SCI. C.S. has a very clear idea of its mission, and reasons why it is needed. We also have a very good idea about our program, and how it will be implemented. From this proposal, the potential participants will have a clear idea about who SCI. C.S. is. This will make it easy for us to explain ourselves, and to make our particular market niche clear at the outset. SCI. C.S. is not for everyone, but for those who want an alternative school, will be able to understand who we are.

The first few years will be the most critical for the recruitment and retention of students, but once people see how we function, and the success of the program, SCI. C.S. will sell itself. We recognize that we will need to overcome the natural skepticism people will have for an unproved product. Fortunately there are very successful programs such as North Carolina School for Science and Math, and the Bronx High School of Science that demonstrate the effectiveness of this type of school. The Coalition of Essential Schools has grown to include some 200 schools by mid 1991. Each of these schools has employed many of the principles SCI. C.S. hopes to follow. Such examples will help us to make the case for our own school, and we can point to these many successes to support our convictions.

We believe that local newspapers, such as the *Patriot Ledger*, will print our story. Once we become known, we intend to hold public meetings and press conferences as we progress.

The first rule of successful entrepreneurship is to do something that you love and believe in. The second rule is to take a proven idea and make it better by adapting it and positioning it in its market niche, rather than trying to take an entirely new invention from inception to

benefit to all who value education. A science and math charter school would help attract families to our community who value alternatives and innovation in education and many of whom may work in professional fields that rely on science and math. We, the founders, reside in Quincy. We want this opportunity to be available to our own children, as well as the children of our neighbors. We value Quincy, and we want the city to be a leader in education as well as urban development.

COMMUNITY CHARACTERISTICS:

The "Quincy Public Schools Option Report" states that:

"Changes in Quincy parallel those of other urban centers in the commonwealth, except that Quincy is not facing the same dire economic conditions that have befallen Brockton, Lawrence, Holyoke, and Chelsea. However, Quincy has seen large cuts in local aid with resultant cuts in the school budget. These have been accompanied by a decline in family income causing families that formerly sent their children to parochial schools to choose public schools. The economic base of the city is shifting from industry to high tech."

According to the QPS Equity Office, the current minority proportion of student proportion is 18% of which 13.5 % is Asian, 2.3% Black, 1.9% Hispanic, and 1.2% American Indian. The growth rate of minority students in the school system is approximately 2% per year.

STUDENTS

There has been an increase in both the overall number of students and the students at risk. Many are reported as "Latch key Children" because both parents work, or they come from single parent homes.

"It is reported that the values of students are becoming more material centered; they are looking for instant gratification, and self esteem among them has declined." ... "More students are working after school with commitment to homework decreasing." (Quincy Public Schools Option Report)

In a school system currently searching for alternative space, the SCI. C.S. would provide a relief from the ever present demographic pressure. by servicing some of the students in a new space not currently available to the school system thus deferring expansion costs from the strapped system. We intend to attract private funding support as well as revenues from both state and federal governments to supplement our program thereby bringing additional resources into the city. If the city supports SCI. C.S., then it would demonstrate the city's bold and historic dedication to educational improvement. The improvement of the public's view of the city's educational policies would help to raise real estate values, thereby increasing tax revenues.

As stated, the successful implementation of SCI. C.S. will help the QPS address the problems facing the students of Quincy, due to our small size, close-knit community, values of respect and work, and the commitment our parents make.

Any student who is currently passing at their current grade is eligible to apply.

1. Completion of the application which must include a two page original writing sample
2. Interview with the student by at least 2 members of the admissions committee, and a full day's visit to SCI. C.S. in the company of a student guide.
3. Parent interview during which the contract of support for SCI. C.S. is presented and discussed.
4. Statements or recommendations from two of the applicant's previous teachers indicating that the student shows a serious commitment and motivation to doing academic work, as well as comments about that student's learning style.
5. Results from standardized (norm based) achievement and aptitude test indicating that the student has a likely potential to succeed in meeting the competency standards at SCI. C.S.. Applicants are also encouraged to present any exhibition of competence. eg. playing a musical instrument, graphic art work, model building, science project or other work that they are proud of. We are interested in any indicators which demonstrate the potential for success in our charter school.
6. Upon completion of the above requirements the admissions committee will meet to determine whether each applicant is eligible to attend SCI. C.S. Decisions will be based upon the fair and consistent application of the standards to the pool of applicants.
7. A school representative will then meet with the family to discuss the finding of the committee and to counsel the family on their best educational options.

7.) PROFILE of FOUNDING COALITION:

Founders

The founders of SCI. C.S., Dr. Susan Campbell, Mr. Peter Burleigh, and Dr. Edward Fitzgerald, created the first vision of SCI. C.S. After long discussions about the possibilities for SCI. C.S. the founders understood that despite the various experiences in education, differing views of public responsibility to schools, and pedagogical variance, they shared a common vision of what a school should be. This strong visionary bond is clearly evident in the mission statement of SCI. C.S. Their idea became the framework for this proposal. After many months of research, meetings, and community outreach, they decided to commit themselves to founding the SCI. C.S. It is with great pride that the founders submit this proposal to form a charter school for the south coastal area.

placement. We, the founders of the SCI Charter School believe that our vision is a good one, that we are qualified and able to carry it out well, and that there is a group of students and parents in our own community as well as within reasonable commuting range of Quincy that will appreciate and benefit from our plan and our efforts

Approval of our charter will make a strong case for us to exist, and we believe that with that approval, we can attract students, raise funds, locate space, and start up an excellent school.

6.) ADMISSION POLICY:

SCI. C.S. will not discriminate in any way. Students will all be chosen without regard to their race, color, national origin, creed, sex, ethnicity, sexual orientation, mental or physical disability, age ancestry, athletic performance, special need, proficiency in the English language, and academic achievement. We intend to attract and serve students from diverse backgrounds, not only those with few financial resources, those of diverse cultural and ethnic backgrounds, and all other interested people.

Applicants must accept the mission of the school and be willing to comply with the requirement for family participation. In the case of a motivated student whose parents are unwilling or unable to make commitments of participation such as we require, the student may apply for a waiver by substituting an acceptable adult mentor (e.g. another adult relative, a former school teacher, community volunteer, or designated service provider). Applicants declare themselves ready to support our ethics of work and mutual respect. Academic standards which determine eligibility will be established by the faculty and approved by the board. These standards will be used to determine the likelihood of the applicant's success with the academic program being offered, but not to discriminate in any way. We wish to make SCI. C.S. universally accessible to all students, but we recognize that our program is clearly different, and that not all students may be able to flourish at SCI. C.S.

The selection process will be based on giving the student the best counsel about his chances of success. We expect to attract those students who have not been as successful in the traditional school as their aptitude indicates and who can demonstrate that alternative learning strategies may be of benefit. We want our mission and our alternative approach to be clearly understood by all applicants so that they can visualize how they will benefit from the SCI. C.S. program. We want self selection to be an important factor in our admission policy. We want our students to make an informed choice that is clearly in their best interest. In the event more students are eligible than space allows the selection will be made by lottery as outlined in Section 89 of the Education Reform Act.

Suggested Admission Procedures.

She then turned to clinical microbiology via her prior profession as a registered nurse, contributing to the application of principles of continuous quality improvement as a hospital administrator in epidemiology and infection control. Recently, Dr. Campbell joined the faculty of Quincy College where she teaches Biology and Microbiology. She serves on the Quincy Educational Development Committee, as a parent member appointed by the Superintendent, to advise the Quincy School Committee on matters of academic policy.

Dr. Edward Fitzgerald is Director of the Quincy Historical Society. He received his B.A. degree at Brown University in English, and holds an M.A. and Ph.D. in English and American Literature from New York University, specializing in New England literature and culture, with a dissertation on the works of Nathaniel Hawthorne. Dr. Fitzgerald has fifteen years of college teaching experience at Stevens Institute of Technology, Rutgers University Newark Campus, and Queensborough Community College. He has also worked extensively as a writer and in the publishing and public relations fields in New York City. He served as Assistant Communications Director for The Lighthouse, one of the nation's largest human services agencies. Following his return to Quincy, where he has multigenerational family ties, his interest in his son's public elementary school education, led him to become an active parent contributor to the educational process. He is a member of the Quincy Foundation for Excellence in Education (a grassroots coalition of parents, teachers, and local business people: a fundraising and grant-making consortium), a representative to the Quincy City-Wide Parents Council, of which he currently serves as President, and was appointed as parent member of the Quincy Educational Development Committee.

Associates

The associates have been involved to varying degrees with the early planning and the development of this proposal. They have met with us, critiqued our ideas, and given thoughtful suggestions. They strongly support the vision, and will continue their involvement with with SCI. C.S.

Rev. Sheldon W. Bennett, Ph.D. is minister of the United First Parish (Unitarian) in Quincy (The Church of the Presidents) since 1986. He is a Former Chairman and current board member of the Woodward School for Girls, a private school in Quincy. He has two children, one of whom attended Woodward and then graduated from the QPS. The other daughter is currently attending QPS middle school. In addition to his Ph.D. in **Physics** from Columbia University, Rev. Bennett also has an M.B.A. from **Boston University** and a M.A. Master of Divinity from **Harvard University**. He has taught physics at Harvard, worked in construction management and management consulting industries.

Ms. Mary Halpin Carter is an educator interested in school reform and in schools where ethnically diverse students thrive in a tolerant environment. Ms. Halpin Carter received a M Ed. from the Harvard School of Education where she studied Teaching, Curriculum, and Learning Environments. She is also a graduate of Dartmouth College where she was a History major. She currently is the Director of Admissions and also teaches at Pingree School. S. Hamilton, MA. She is a certified teacher in Massachusetts. She resides in Charlestown, MA.

Biographical Sketches:

Mr. Peter Burleigh is a resident of Quincy with an 8th grade son, who currently attends Thayer Academy in Braintree. Mr Burleigh is an educator with 29 years experience in a variety of school settings including: University of Maine, a New Hampshire public school, a private boarding school, a secular school in Newfoundland, Canada, and Thayer Academy, Braintree, MA. Mr. Burleigh has taught Biology, English Literature, Creative Writing, Geology, Marine Science, Ecology, A.P. Computer Science and Pascal. At Thayer Academy he was Chair of Sciences and Computer Sciences as well as Administrative Dean. He left Thayer in 1992 to become Headmaster of a private elementary school with 195 students, 30 staff, and a \$1.3 million annual budget.

Mr. Burleigh is a graduate of the University of New Hampshire, where he majored in Botany and received a B A degree. He has spent additional years doing graduate work at University of Minnesota, University of New Hampshire, and UMass, Boston. He attended public high school in Franklin, N.H.

Mr. Burleigh was selected from an international pool of applicants to become one of 12 Klingenstein Fellows at Columbia University in 1989-90. He completed a MA in School Administration. Mr. Burleigh passed the Doctoral Certification Exam, and is currently a candidate for a D.Ed. in the Department of School Administration at Teachers College, Columbia University.

Mr. Burleigh has applied for certification as teacher and principal in Massachusetts. As a result of the intensive exploration of educational issues facing the nation he undertook during the fellowship, he became committed to educational reform, and he has recognized the necessity of alternative educational opportunity within the public school system. Currently he teaches at Quincy College and works as an educational consultant.

Dr. Susan Campbell has lived in Quincy for the past 14 years. She has two children, ages 8 and 3, the elder attending a public elementary school, and the younger a for-profit preschool. Dr. Campbell holds B.A. and Ph.D. degrees in biology from Boston University. She is a certified teacher in Massachusetts and has taught grade 10 biology in the Brookline and Milton public schools. She has taught college microbiology at several area colleges and universities. She also gained business experience via scientific and financial consulting for clients such as Getty Oil Co., the NIH, and University of Frankfurt. Dr. Campbell is fluent in German and also speaks French and Croatian.

Funded by the National Sciences Foundation, NASA, and others, Dr. Campbell conducted research in microbial ecology involving extreme environments (desert soils, hypersaline solar pools, and the deep sea) as a Research Fellow at Boston University before embarking on a series of post-doctoral fellowships including NATO and NAS Eastern European Exchanges, studying pollution of the Mediterranean and Adriatic Seas. Subsequently, at the U.S. Agency for International Development as a AAAS Science, Engineering, and Diplomacy Fellow, she contributed to early drafts of the global Biodiversity Treaty, holding planning sessions and writing USAID position papers on sustainable development and biotechnology.

Dr. Somnath Sengupta teaches chemistry at Quincy College. He is also a chemist at the U.S. Army Research Labs, Watertown, studying ferro-electric thin films. He has a Ph. D. in Engineering Science from University of South Florida. His thesis was on solid state lasers. He previously held a post-doctoral appointment at MIT, and worked at Xacton Corp. in Bedford, MA on infrared semiconductors. He has 10 years teaching experience at the college level. Dr. Sengupta has extensive experience teaching all aspects of mathematics. Dr. Sengupta has three children. One of his daughters attends first grade in public school.

Ms. Ingrid Shaffer, Quincy parent, public relations, community relations professional, free-lance and newspaper writer, volunteer art and reading program Wollaston School. B.A. English Literature Boston University, MA Teaching Simmons, matriculated in MA library science program.

Supporters

Supporters are concerned persons who have read the proposed executive summary, mission statement, or full proposal and who want to indicate their support of the SCI. C.S. charter school (see list of supporters in the appendix).

The three principle founders first met on October 1993 to discuss their mutual interest in forming a charter school. Following the initial meeting, where a high degree of agreement was established, they each wrote a mission statement that described the concept of a charter school. These three mission statements were then discussed, and eventually reworked into the mission statement which is enclosed in this document. Many meetings were then held with other interested associates and other professional educators. Eventually the detailed vision emerged. The founders want to express their gratitude to everyone who helped to enlarge, improve and focus this idea.

8.) TIMETABLE

We recognize that no school can suddenly be brought into existence as conceived. A lengthy period of planning and then implementation would have to precede the actual opening of the school. The largest single issue for all charter schools is the capital funding needed to provide a facility with adequate space and equipment. Once a funding level is available sufficient to begin, there would have to be a phase of implementation. The major obstacle will be finding a facility which will meet school codes and allow handicapped access.

If the law is changed to allow a 1994 start up, we believe that we can meet the deadline, although we have many unresolved issues regarding this, especially start up funding. The founders are able to devote extensive time to the project should they receive charter approval. In the event start up remains at fall 1995, the founders will still be committed to establishing SCI. C.S.

In order to build the school climate we want, and to establish the alternative learning methodologies we envision, we will need to start small. We will gradually phase in additional classes and students over several years until we reach our anticipated full capacity of about 360 students in grades 7 through 12. In the first year of operation we will open just the 7th and 8th grades. (60 students each grade level). During each of the four succeeding

Mr. Eugene Chikov, the father of a Milton middle school boy, is a physicist and mathematician who received his MS degree in physics and is a candidate for Ph.D. in electrical engineering at the Moscow State University. He has taught all levels of physics and mathematics from middle school through graduate school. In a program unique to the Soviet Union, he taught courses in mathematics in the German and English languages to Russian high school students studying those languages. During his fifteen years of work in high school, Mr. Chikov taught interdisciplinary physics and mathematics in which he developed criteria to test students' skills and wrote computer programs to evaluate their progress. He tutored many students in math for the rigorous Russian college entrance exams. He also lectured and held seminars in mathematics for graduate students and engineers in Moscow Institute of Communication, Moscow Institute of Energy, and Moscow State University. Most recently, Mr. Chikov applied his knowledge of computers and mathematics as a specialist in the field of remote sensing, especially with regard to false color applications.

Ms. Carmen Karasic is the mother of a ten year old girl and six year old boy, both of which attend Quincy Public Schools. She is also a software engineer at the Lotus Corporation in Cambridge, MA, who uses event-driven (object-oriented) programming to test software components in the new product development division. Prior to that, she was an MIS manager for several years serving financial and human resources departments at Lotus Corp. Additionally, she has 12 years of programming experience at Teradyne and Polaroid Corporations. A math major, with minor in computer science, Ms. Karasic has taught courses in college Remedial Math, Assembly Language, and Introduction to Computers and Programming in Basic. Ms. Karasic serves on the Board of Directors and is Vice Chair of the MJT School of Dance, which involves high school students of Weston and Boston via outreach programs that seek to engage and motivate students through dance to avoid dropping out of school. Students put on a professional-level performance in a downtown location annually.

Mr. Donald Spink is a 5th degree karate black-belt with twenty years experience teaching and practicing karate. A resident of Weymouth and parent of three elementary school children (two girls and a boy), he is a Quincy businessman who owns, operates, and teaches in one of the most successful for-profit karate schools in this region, and one of the longest standing karate schools in the same location on the South Shore (14 years in Quincy Center). Mr. Spink has been recognized for his outstanding work with disabled children. Two of his own children (a first grade girl and fourth grade boy) are involved in martial arts. The youngest students accepted are 4 year olds. The oldest has been in her 70s. Mr. Spink is a member of the Board of Directors of Masters Self Defense Centers Inc. He also serves as advertising director and international tournament coordinator for the company. A practitioner of his sport, Mr. Spink participates as well as teaches clinics to other karate masters monthly, a method used to cross-train the black belts in the system and provide for exchange of philosophy and technique.

Mr. William Semple is a resident of Braintree. Mr. Semple is a graduate of M.I.T and the Naval Post Graduate School, Monterey, CA.. He retired from the Navy as a Commander in 1969 when he became a math teacher at Thayer Academy in Braintree. Mr. Semple retired in 1984.

At a current rate of about \$6,000 per student the operating budget for year one would be approximately \$720,000. We anticipate about 63% to be for salaries taxes, and benefits (Administration included): therefore the average salary would be \$38,000 (based on 9.5 positions the first year). This is based on full time equivalents, but in reality we anticipate many part time assistant teachers, and specialists. Expenditures for maintenance, utilities, insurance and lease payments would use up about 23% or \$160,800. The remaining \$100,000 would support program and other expenses. We would expect to continue this ratio during the next 4 years as the income grows with the addition of more students. (Figures are based on real budgetary data from a similar sized school)

An important aspect of the early years would be the expenditure of resources into fundraising and institutional development. We would anticipate a full time development person during the second year. During the first year we anticipate 3 half time administrators: principal (headmaster), business/accounting, and development. Later this would grow appropriately with the school's population.

We anticipate a lesser administrative burden for the principal and other administrators than is usual for a school of this size. This is because they are also expected to teach. Due to truly collegial and collaborative effort, both teachers and administrators share responsibilities for the overall operation of our the school. Our administrative costs will be much less than in a comparably sized conventional public school system with its large size and "top down" hierarchical administrative structures.

During the second year, we plan to develop a summer program for SCI C.S. This program will attract students who want to study science and math in an experimental or field study atmosphere. Using the facilities year around is cost effective, and we see no reason why the summer program could not charge tuition, and thereby provide needed revenue to the program.

PART II

9.) COMMUNITY SUPPORT

The founders represent concerned parents, educators, and business people from a wide constituency of the South Shore. We collectively recognize the need for innovative educational opportunities for our students. Our children have experienced the public school system at various levels, and it is our unanimous view that alternative methods of learning which raise rather than lower expectations, and involve rather than disenfranchise the parents in the education of their children are needed. As educators and life long learners we also understand the need for faculty cooperation and collaboration in the governance of the school.

years we will add the 9th through 12th grades. Admissions will be limited to students entering the 7th grade (+60 each year) and for positions in classes due to attrition of students from the program. It is our expectation that attrition will be low. New students entering at upper grades would have to be able to adapt to a very different school environment from the one they have previously known. Once we have a core of learners who are thriving in our close-knit community of learners, they will serve as mentors for new admissions.

From the financial and practical viewpoints this planned growth also has advantages. We will require less initial capital, and then can attract more as we prove ourselves and demonstrate our concept in practice. In addition we expect to change to a different facility at least once during the first five years. We plan to lease space in the early years, and we hope to attract enough capital to purchase a facility particularly designed and suited to our needs before the end of the 5th year. It also means that staff size can be kept to a minimum during the formative years, and that a core of dedicated faculty, a board and administration can be built up carefully to optimize our chances of success.

As mentioned in the section on governance, the founders will transfer authority to set policy to the democratically elected board by the end of the 3rd year of operation.

Based on our general plan and our commitment to a 15:1 student to teacher ratio, the physical nature of the school would be something like the following during the first five years:

PLANNED GROWTH

Year	Students	Classrooms	FT Equiv	
			Teachers	Admin
1	120	8-9	8	1.5
2	180	13	12	2
3	240	18	16	2.5
4	300	22	20	3
5	360	26	24	3.5

A 1:15 teacher to student ratio is planned for our school. In addition to greater time with students, additional time must be planned to allow teachers to participate in collaborative efforts. It is essential that this time be made available to the faculty. SCI. C.S. will be able to provide this time because:

- 1.) we use part time assistant teachers, adjunct specialists, and many supervised student directed activities,
- 2.) The faculty will be dedicated because they are an integral part of SCI. C.S. Our success or failure will be a result of the joined community effort to benefit learners.
- 3.) Parents will be committed because our common goal is the success of their children. They realize they are important partners in deciding who we are and what we do.

humanities component. It will limit its other academic offerings to the following subjects: English, history/ social studies, and foreign languages. The founders of SCI. C.S. recognize the importance of many other intellectual areas but SCI. C.S. chooses to cover the basic competencies thoroughly in the above academic areas rather than to weaken our efforts with a curriculum which is defined too broadly. As a result of SCI. C.S.'s recognition of the different rates of progress our students will make, SCI. C.S. will provide Advanced Placement and seek to establish articulation agreements to allow college courses for those students who have completed their basic competencies in one to several subjects before they graduate.

Cooperative learning, team teaching, and collegiality will be primary characteristics of the program. We intend to establish a climate where it is *safe* for everyone from the head administrator to the youngest student be a learner. It will be more important to know how to find the answers, and use resources to critically determine the best source of information, and how to use it, than it is to know the answers.

SCI. C.S. plans to be open for students and teachers from 8:00 AM to 5:00 PM during every school day. SCI. C.S. will be closed on all normal holidays, and will generally follow the public school calendar. Although we may not be open the 180 days required of public schools, due to our longer school days, our students will be in classes more than the equivalent number of hours students currently spend in their classrooms during a public school year. We also think that our model of schooling will allow much more time on task, and a high rate of student productivity. We also plan to make our facilities available to families and students in the evening and on weekends to help build our school community.

Master teachers will be used to lead and guide student activities. However, groups will often be supervised by teacher aides, freeing the master teachers for more effective contact time with individual students. At least 50% of the class time will be supervised by a core of full time master teachers in order to assure continuity to the program. In all cases the students will be presented with a variety of methods for learning a given competency so that many learning styles are addressed. They will be given many opportunities to demonstrate the competencies they develop.

The performance goal is that SCI graduates be fully prepared to excel in college liberal arts courses and, indeed, to concentrate in one of those disciplines if they were to so choose. The developmental goal is that SCI graduates be adequately prepared so that the knowledge and methods of **thinking** and **perceiving** that are characteristic of the humanities will inform the rest of their lives as individuals, members of a family, and citizens in a democracy. We offer as an example of the standard to which we aspire the depth and excellence in humanities that has traditionally been a characteristic of New York's Bronx High School of Science.

The SCI C.S. curriculum will be centered around the sciences and mathematics. but it will not reduce or neglect the study of humanities. Our objective will be to produce students who are mathematically, culturally, and historically literate and able to demonstrate in effective ways their skills and knowledge in effective ways.

There is a widely documented need for science and mathematics to be a greater focal point of public education in Quincy. When it became apparent that the charter school approach offered a way to help with this problem, we began working on this proposal. Early in the process we recognized the importance of cooperation with community leaders. As a result we have met twice with School Superintendent Eugene Creedon and Mayor Sheets. Dr. Campbell has also met with Mr. Arthur Woodward, QPS Information Director, and with President Donald Young of Quincy College to discuss our concept. Both felt our ideas had merit and were open to continuing dialog as we develop our proposal.

The appendix contains signed statements of support from members of the founding coalition.

The marketing section describes how we plan to broaden our base of support.

10.) PROGRAM:

In keeping with the spirit and intent of the Charter School provision of the school reform act, the SCI. C.S. program will be innovative in many ways. Assessment tools will be varied, and the grading system will be based on the demonstration of competency as defined by the standards in each discipline, and according to the level the student is currently studying. The setting of these explicit standards cannot be done until a core group of faculty is hired. This needs to be a faculty led effort.

The daily program will include some classroom lectures, but will also use student cooperative learning, problem solving, portfolios, exhibitions of mastery, standardized testing, field and practical lab experiences as well as physical activity. We envision an individual student being scheduled for problem solving groups, lecture classes, discussion groups, practicums, tutorial sessions, as well as individual study time. In order to accomplish these goals the SCI. C.S. day will be longer than is usual for the public schools.

A key component of the SCI. C.S. is that students will be grouped by mastery rather than by age, although, in the initial years of the school when most students entering will stem from the same grade this will appear to be structured as "tracking". However, with time, and as the school grows in numbers the mixing of ages will increase and the appearance of "tracking" will diminish.

The challenge is to discover cost effective and different ways of delivering a high quality education by using different organization of time, especially that time the master teachers spend with students. By limiting the scope of offerings to our five core areas our resources will be applied more effectively than is possible current state curriculum requirements that apply to other public schools. The expected result is students who are highly proficient in the disciplines most needed to succeed in life, further study and career development.

The SCI C.S. curriculum will be as integrated as possible in order to promote comprehensive education. The program will have a clear emphasis in math and science, but SCI. C.S. will also have a strong

only that the study of science along with general application of the scientific method of discovery in our interdisciplinary program lies at the heart of our curriculum. It is also intended to convey that there is joy in this experience and invitation for creativity, and new ways of viewing things. This is exemplified by the play on words and symbols in the logo, particularly in the substitution of "!" for "I" in the words Institute and SC!ence.

We expect an exponential increase in our students' abilities to apply critical thinking to problems relevant to pure science as well as to their daily lives. Thus, the expression in our logo is raised to the power of 3 (sic!).

The need to first master and then challenge convention lies at the core of this proposal to change the way a public school is organized, and find a new way of organizing a school concentrating in science and mathematics. Challenging convention is as pivotal for the planned curriculum, as it is central to the true advancement of knowledge in science as a discipline.

Mastery of any discipline or skill takes time and practice, whether it is math or athletics. The SCI C.S. curriculum will focus on learning and expect parents and students to provide their own enrichment that goes beyond that intrinsic to our interdisciplinary course of study.

The martial arts form the core of the athletic program which is dedicated to advancement of the learner at the individual's own rate and the tradition of students mentoring one another.

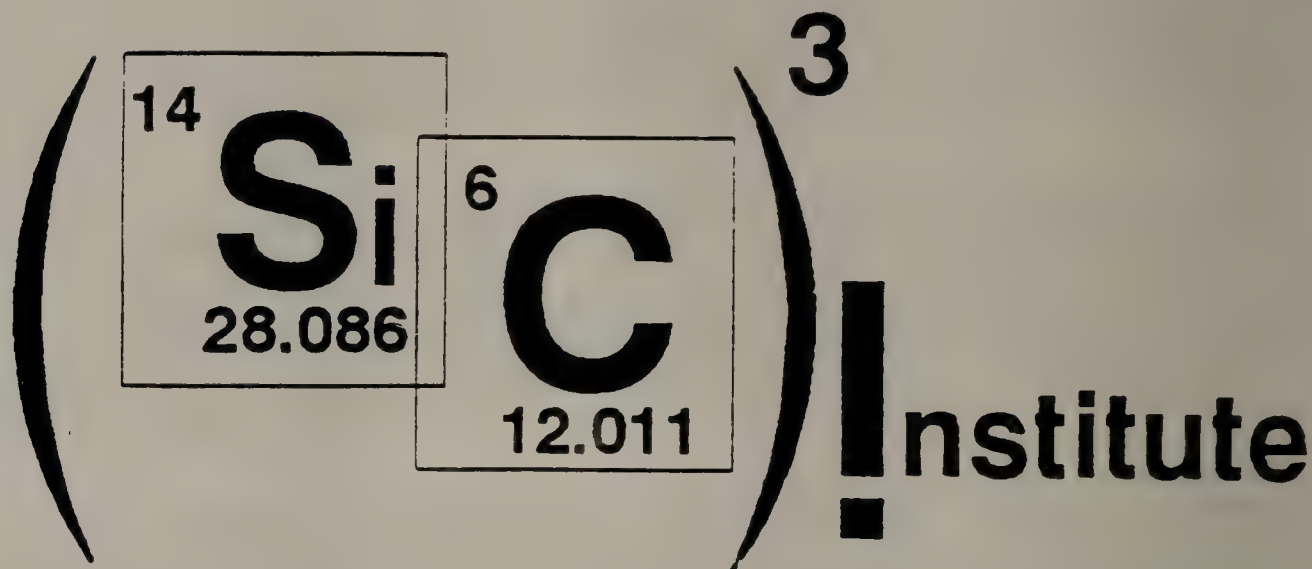
Many interdisciplinary projects undertaken by every student will have a math or science component (e.g. graphing, statistical analysis) as well as written, visual and/or oral English presentation skills as integral components.

All of the students who graduate from SCI C.S. will have mastered competencies of the curriculum and will have demonstrated this through test taking and projects in the individualized interdisciplinary program.

We will gradually develop our diagnostic, prescriptive, and individualized curriculum components to be analyzed and taught with the aid of computers. Initially, this aspect will be limited by our ability as a start-up school to attract funding and financing for appropriate hardware and software. The SCI S.C. curriculum is based upon the Quincy Public Schools (QPS) Student Centered Learning System (SCLS, 1978) a comprehensive, individualized approach founded on the concept of the "computerized expert system" of diagnosis & prescription at the individual student level that was "ahead of its time" conceptually and practically and practically speaking.

We expect to contribute to the development of task-appropriate software, possibly as a test site for commercial developers, and plan to contribute to our local and regional school systems by keeping them informed of our initiatives and progress. We seek to reach back to the SCLS foundation and tradition, maintain connections with the current QPS curriculum (also derived and developed from that source), while aligning ourselves with current advances in state and national curriculum design, many of which were anticipated by SCLS. Overall, we view ourselves as

The fundamental ideas about the nature of our curriculum and its expected effect on the targeted student population is best summarized in the design of our logo.



"South Coastal" reflects our physical setting and implies an environmental and marine industrial connection. It also designates the region from which most of our students are expected to come. Many will live here in Quincy. Many will come from surrounding towns commuting into town daily with parents on their way to work in Boston. Si is the symbol for Silicone, the element upon which the computing industry and emerging telecommunications technologies are based. The importance of research and development in these industries for our local economy is well-known and expected to continue for the foreseeable future. C symbolizes Carbon, the element upon which life on the planet is based. The chemistry of life is the chemistry of carbon. The biotechnology and health industries are increasingly based on understanding of molecular and biochemical processes.

The study and use of math is becoming essential for advances in basic and applied research in the sciences. It is an organizer of thought and a language that communicates organized thinking. As the stated objective of the U.S. Department of Education is world leadership in science and math by the year 2000, our curriculum will reflect this goal and endeavor to make it a reality for SCI C.S. students.

The central role of statistics in scientific literacy which accounts for many of its proofs and its power of communication is conveyed by our adoption of the factorial sign "!"; the factorial being mathematical shorthand for the number of ways (permutations) that a number of distinct objects can be arranged in order. This expression is especially symbolic of the scheduling and organizational challenges inherent to a course of study in which each student will proceed at her or his own pace. The "!" also represents the "Aha!" experience that hooked those of us founding, contributing to and participating in the development of this school. Our goal is to cultivate a culture that respects the life of the mind. It is this experience of the mind that we want most of all to make accessible to our students. Thus, our acronym "SC!" implies not

an educational institution dedicated to the ideal and practice of research and development as a way of life.

We will endeavor in curriculum development, teaching, administration, and through nurturing and recognition of student achievement, to attract representation of natural groupings of people residing in our region. We will recognize, solicit, and celebrate achievements and merits of each of our students, personnel, and parents. We will support sharing of historical, ethnic, religious, and cultural differences whenever they can be seen as appropriate and relevant to our program of academic study, and cultivate an ethic of mutual respect and tolerance. We will always proceed from the fundamental view that as people we share the same feelings, and as Americans we expect the same opportunities. We will strive to develop in all our participants an expectation of mutual accountability, high achievement, self-esteem and measurable success, tempered by acknowledgment of adversity to be overcome in the daily lives of our school members, throughout life, and society. We will foster a sense of allegiance to our school and local community, as well as our country and explore the meaning of such ties as we simultaneously cultivate a culture of being citizens of the world.

The SCI C.S. interdisciplinary program of study is conceptually analogous to the Sizer Coalition Schools' approach. It involves collaboration and cooperation among small groups of students on issues of practical (common life) concern.

The SCI C.S. core values are Self-paced Learning, Collaboration, and Intellectual inquiry. These values are as applicable to the conduct and expectations of faculty as they are of students, and provide the framework from which all other concepts and programs are derived. We will prepare our students for a lifetime of learning from and about one another and the physical, chemical, biological, social world we inhabit and contribute to. We do this by acknowledging as teachers, that despite our areas of specialization and expertise none of us "knows it all" or ever will. We expect to learn as much with and from our students as we do preparing to teach and evaluate them. Together with them and their parents we will become a community of learner/teachers. Our parent student contract will codify this approach.

The SCI C.S. Philosophy of Curriculum

The philosophy leading to the SCI C.S. Curriculum Framework for both mathematics and science is reflects in large part, the 1993 draft National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards (1989) NCTM preface to the assessment standards:

1. Every student is capable of thinking about problems rationally, scientifically, and able to achieve mathematical power

(and the scientific approach) that will enhance all three approaches.

2. Evidence of student performance is expected to vary with the purpose.
3. Information needs to be collected from various sources (observation, student responses to questions, examinations of student products).
4. All evidence about student performance is considered as a sample of possible evidence that could have been gathered.
5. Teachers recommend and implement curriculum. Together with their students, they create the learning environment and atmosphere.
6. Teachers are the primary assessors of student performance.
7. Students should grow in confidence and in their ability to evaluate their own progress and performance, and to evaluate their own learning environment and make suggestions to their parents at home and their teachers in school to improve it.
8. Parents will be encouraged to be realistic in their view of their child's actual level of mastery, supportive of raised expectations, patient but firm in their supervision of homework and project completion.

Philosophical Criteria that may guide and justify the selection of learning activities include: philosophical, psychological, technological, political, and practical (McNeil, 1981). The following values, according to George Herbert, should provide the chief basis for judging proposed learning activities:

1. Learning activities should be enjoyable but lead to desirable future experiences.
2. Learning activities should show the ideal as well as show life as it is.
3. Learning activities can deal with the thinking, feeling, and acting of the group to which the learner belongs or those attributes of other groups of people.
4. Learning activities involving the pursuit of universal truths should minimize human variability by stressing common outlooks and capacities, but also stress individuality by meeting the needs of the individual student.
5. Stressing cooperation, so individuals share in achieving a common goal, or competition so that an able student may excel as an individual will affect what is accomplished. At SCI C.S., cooperative learning is stressed in the interdisciplinary program, whereas competitive learning is stressed in the master-grouped (rather than age-grouped) pure science and math classes.

6. Both self-discovery/clarification and teacher or student-led instruction can be used for presentation of moral and ethical principles and problems.

Although Herbert has labeled the following elements a "closed view of learning", in our opinion it is this model we accept as valid for an individually paced, pure-discipline course of study. It involves that the learner:

1. be under the direct influence of a teacher. The teacher demonstrates, and the student imitates to acquire knowledge.
2. experience the learning environment and process as pleasant and comfortable.
3. be taught one thing at a time, to mastery. Enough examples are given to help the learner abstract desired generalizations.
4. be allowed to acquire simple basic patterns before exposure to higher orders of learning.
5. be allowed to see and integrate models of speaking, feeling, and acting.
6. engage in repetitive practice on a skill not yet mastered.

A different model (Herbert's "open-minded approach") to learning is the one we accept as valid for our interdisciplinary program. In it the learner will:

1. be removed from direct teacher influence, allowing self actualization by finding meaning in a situation where the teacher is a resource person.
2. be allowed to experience hardship and perplexity, so that significant growth can take place.
3. experience several outcomes at once, developing new interests and attitudes, as well as experiencing cognitive growth.
4. be offered the opportunity to grasp the meaning and organization of the whole before proceeding to study the parts.
5. be able to create and practice new and different ways, of talking, feeling and acting.
6. experience novel and varied approaches to an unlearned skill. In fact, in a science and math charter school like SCI, the scientific method will be more prominent in the interdisciplinary as well as the pure-subject components of the educational program. Accordingly, the width of novel and varied experiences that might be derived will not be as broad in scope as in a school organized with the arts or humanities as its core discipline.

Key components of critical thinking, according to Herbert, which we believe are generally applicable regardless of the subject involved, include the affective and the cognitive.

Affective:

The learner:

assumes responsibility for reading the assigned material and studying illustrations.

voluntarily pursues the appropriate meaning of special vocabulary.

desires to know the answers to questions

voluntarily seeks authorities to prove or disprove the assumptions.

assumes the responsibility of finding creative ways to solve problems.

Cognitive:

The learner:

recognizes words in context and demonstrates his/her ability to use them as s/he explains the assumptions.

develops ways to use the special vocabulary.

recognizes cause-and-effect relationships and uses the knowledge to relate parts to a whole.

compares, contrasts, and extends boundaries of topics.

knows how to make discriminating choices.

recognizes and understands the meaning of contrasting statements.

states the assumption in the opposite form.

recognizes a need for a logical conclusion based on evidence
comes to a conclusion.

decides that the original assumption was right or wrong.

if it was wrong, the learner makes a new assumption based on additional facts and authorities, reflects on the process employed, and recognizes that critical thinking was used.

Science Curriculum

Curriculum expectations in science in the US seem to have progressed from what is taught (usually a collection of facts such as classification of plants and animals) to what was to be learned (e.g. "After you have made an ecological analysis of five taxonomically classified plants or animals, show your understanding of the values of the taxonomical system or the ecological system to the biologist"(ES-70 terminal behavioral objective, 1971, QPS)).

Current efforts toward a general U.S. curriculum are being undertaken by three professional groups: the National Science Teachers Association (NSTA), The American Association for the Advancement of Science (AAAS), and the National Research Council (NRC). The trend is to stress application of underlying principles and the drawing of general conclusions, including the limitations of scientific method and knowledge (e.g. "by the end of the 8th grade, students should know that one of the most general distinctions among organisms is between plants, which use sunlight to make their own food, and animals, which consume energy-rich foods. Some kinds of organisms, many of them microscopic, cannot be neatly classified as either plants or animals." "By the end of the 12th grade students should know that the degree of kinship between organisms or species can be estimated from the similarity of their DNA sequences, which often closely matches their classification based on anatomical similarities." AAAS Benchmarks, 1993).

National Science Education Standards are being developed by the NRC at the request of both President Bush and President Clinton. They will be subdivided into K-4, 5-8 and 9-12 levels. "The curriculum standards will not prescribe particular courses, programs of study, or textbooks; assessment standards will not be a set of examinations; teaching standards will not be certification or licensure specifications." Instead, "Overarching goals and criteria will be provided, and examples used to illustrate the range of what is possible, not define the one "best" approach".

In Massachusetts, a similar effort known as the Partnerships Advancing Learning of Mathematics and Science (PALMS) is underway. It is described as "frameworks designed as tools to be used by teachers, schools and school districts, colleges and universities in planning and evaluating instructional programs from pre-kindergarten through grade 12 and in adult education. Like the NRC Standards, the PALMS project is not intended to provide daily lesson plans. It is designed to show how topics within a discipline can be blended into the instructional program."

The NRC maintains that there are two points that are fundamental to the success of teaching and learning science: "The subject matter of science must be consistent with the body of scientific knowledge from which it is derived. Content should reflect the current state of knowledge". Science must engage students in the study of the natural world in ways that reflect science as it is practiced. Teachers must model, and educational materials must reflect the demand for evidence and reasoning that reflects the spirit of scientific inquiry."

Both of these tenets are fundamental to the teaching and learning process as we envision for SCI C.S. We would argue, that except in unusual circumstances, an individual who has only learned about science but has not been a scientist, is not as well equipped to teach current content in the context in which it is practiced as someone who has been or is a practicing scientist. Accordingly, we believe that it is essential for education that a way be created to attract and engage scientists who are also educators in the public school educational process.

Science Subject Matter

The actual SCI C.S. curriculum will not be finalized until after we have hired a core group of master teachers, as we recognize that it is empowerment of the professional teacher that will bring about the creativity and involvement we seek.

It is probable that there will be some students entering and leaving each year from and to QPS. These students need to have a bridge. The foundation for this bridge is the QPS Student Centered Learning System. This curriculum is behavioral in its orientation (ES-70). Consequently, the SCLS matches rather well (even at inception in 1974) with the recently released AAAS Project 2061 benchmarks, especially at the middle school level and in the physical and chemical sciences. It is even more closely aligned with the NRC framework, organized as it is around the three general domains of the natural sciences: physical sciences, life sciences, and earth and space sciences. Accordingly, the SCLS curriculum is expected to provide a reasonable point of departure for the development of the SCI C.S. curriculum, particularly in physics and chemistry, without sacrificing any opportunity to be very current with emerging state and national guidelines. As we continue to explore the SCLS curriculum and draw comparisons with our own ideals and those of our yet to be hired master teachers there will surely emerge discrepancies and differences of opinion in approach. At present, it appears that the arena in which we may be able to contribute best to QPS is in the areas of cell biology and genetics.

Although most scientists recognize a five rather than three kingdom system, or else adopt a genetically based three superkingdom system, organisms are increasingly viewed as chemical systems (interactions between the elements of life C,H,O,N, and P involving their organization into molecules and macromolecules that interact in metabolic pathways and facilitate the flow of energy via oxidation/reduction reactions, within and among organisms for their individual survival and survival of the biosphere). Plant and animal nutrition in individuals and among communities is studied with respect to cycling of energy and matter. Molecular and organismal genetics and its role in natural selection and evolution is also stressed.

Whether the QPS High School Curriculum is better reflective of the 2061 biological science benchmarks than the middle and elementary curriculum are, is difficult to ascertain, due to the different format of course description used that makes comparison difficult. It is known, anecdotally, that many of these aspects are dealt with in a more up to

date way by the individual teacher than the curriculum suggests. Accordingly, considerable original work on a biological sciences curriculum based at least in part on the QPS-SCLS model will be needed for the SCI C.S. initiative to maintain any parallels with QPS on this topic.

At minimum, however, we will attempt to retain the SCLS criterion-referencing numerical system to enable easy translation between our respective curricula. This will also maximize our ability to share our curriculum and instructional materials with QPS as they are developed. It is our clear intention to be a resource for Quincy Public Schools as we hope they will be a resource for us. We have made our position and character clear: we envision the SCI Charter School to be an independent but cooperative partner with QPS and surrounding towns if they so desire. The role we will play is at once classical in our college preparatory pathway although more demanding than the typical public school, and dedicated to research and development in the art and science of teaching. It is this atmosphere and approach to learning we hope to convey to our students towards a renewed culture of merit and academic work ethic. To the best of our ability, we will work towards development of and implement measures of accountability for our students' success.

The NRC Framework for content standards in science that we will monitor closely as the draft document progresses to finalization will be organized as follows:

Science subject matter: principles, facts, laws, theories

Nature of science: perception of the intellectual character derived through observation, experiment and experience, via acquiring of a base of knowledge & the process of inquiry.

Applications of science: carrying out investigations to understand modes of reasoning involved in scientific inquiry

Contexts of science: how science relates to students' lives

The Sci C.S. approach to meeting these content objectives involves the building of a school within a school. The one school is conceived to be core of curriculum approach, the other is interdisciplinary and involves small group projects and tutoring as well as individual projects. As such, it will make use of all relevant modes of teaching and learning.

It is possible for students to take a purely Aristotelian approach to the learning of science subject matter, by discovery through inquiry. We will encourage such an approach as the most immediate and thus most motivating experience. However, this approach would probably not allow for most students to graduate with the knowledge base expected for entry into college at the usual age of graduation, and to perform well on the SAT, ACT and other norm-referenced tests. Accordingly, we have chosen to present a classical college preparatory curriculum in a regular and rigorous classroom lecture/ discussion/ lab format (with the emphasis on lively discussion). We will expect more work of our students than do comparable public schools in this area.

The acquisition of an adequate base of knowledge is essential to meaningful inquiry that reflects the current state of scientific knowledge. Students will be expected to demonstrate mastery at intervals, including the yet to be developed Massachusetts 10th grade test to enable admittance to a high school diploma-conferring program. The SCI C.S. demonstrations of mastery may include but will not be limited to norm-referenced tests, and criterion-referenced tests. The process of inquiry can be taught in the classroom setting, although the experience is best conveyed in the laboratory. Laboratory exercises will be carefully chosen and organized so that students can experience predictability of outcomes in experimentation.

The process of inquiry, application of science, and context of science will form the central foci of the interdisciplinary program. Here, learning will involve more "doing", will be more reflective of the personal interests of the student, and will involve an almost continual seeking of "relevance". This open program will evolve each year to reflect the interest and expertise of the students, master teachers, and support teachers and aides. The program may be thematic. It will almost certainly involve public speakers, chosen for their ability to inspire and motivate. It will stress the predictive rather than the predictable aspect of the study and use of science, and will help students begin to cope with the unpredictable and unanswerable. Some possible themes may include:

- Emerging techniques and issues in biotechnology: how individuals, families, and the species may be affected by choices made by scientists and society.
- Intellectual property rights in medicine and biotechnology in the global information age. Who wins, who loses and by how much?
- How fundamental concepts in genetics and pharmacology will change prophylaxis and medical therapies in the next decade and beyond.
- How changing patterns and rules of world trade in the new north-south political alignments will affect species diversity and distribution if present patterns continue.
- Robotics: current developments, future trends and issues of importance for the everyday life of the average U.S. citizen.
- How changes in materials types, availability and usage may change how we live, work, recreate, and value.
- Environmental problems of the Fore River basin and their relationship to quality of life and economic trends in the local economy of Quincy, Weymouth, and Braintree.

The most recent Biological Science Curriculum for the QPS elementary (1989), and middle school (1986) cohorts, are less reflective of recent advancements in scientific theory especially in the following categories ("Benchmarks for Science Literacy", AAAS Project 2061, 1993):

A hypothetical lesson in which students are asked to break into small discussion/research groups to address the following questions, summarize and then present to the other groups is outlined below. It

also illustrates how current topics in health can be woven into the fabric of a science lesson and yet be perceived as very relevant:

Why is HIV disease called a spectrum disease? Using a graph, describe its major clinical stages of progression.

Why doesn't AZT cure the disease if it can kill pure HIV virus?

When does HIV disease become AIDS? What changed? Why is this clinical picture unusual even though none of the opportunistic pathogens involved is new to science?

Name several ways HIV can be transmitted, and explain how the risk of transmission can be reduced for each.

Name several human activities involving physical contact that do not carry a transmission risk (e.g. shaking hands). Explain why this is probably so, including in your answer the underlying principles involved (hint: discuss histology of skin and reservoirs of HIV in different body tissues)

It has been calculated that the risk of acquiring HIV disease occupationally through needlestick or other blood-to-blood contact such as an auto or sports with HIV contaminated blood of another is 1:250. Is this a high or a low risk? Defend your answer.

Find and invite someone with HIV disease to visit the class. Ask them to tell what it is like to live with this disease.

Cite your sources in a short bibliography using standard format.

Student discussion groups, research papers, and teams may be organized around topics of social concern such as the debate as to whether electromagnetic fields (EMF) can cause childhood leukemia. The lesson might begin with a physics demonstration of an electric coil that generates an electromagnetic field. Students could be introduced to a Gaussmeter, and then use it to measure EMF within and around the school. They will discover that these fields drop off quickly as one moves away from the source. They will be asked to plot the experimental data and then attempt to derive a formula that would explain the data.

Students will be asked to list the types of equipment (household and industrial) that may generate electromagnetic fields. They could be asked to investigate what steps were taken by the U.S. Government to rule out the leukemia hypothesis (Oak Ridge Associated Universities report, 1993). They could also find out which medical technologies make use of electromagnetic fields, how they work, and why they are thought to be safe. In group discussion, students could offer suggestions regarding the differences between the two situations, and speculate as to why one might cause cellular damage and the other might not. This would logically lead into a unit on cell structure, function, development, and specialization. Later in that unit, students may be asked to establish a plant or animal tissue culture or embryonic eggs and devise experiments in which they are exposed to electromagnetic fields of varying intensities for varying lengths of times.

The Mathematics Curriculum

The SCI C.S. will derive its expectations of achievement of students and teachers of mathematics by review of the National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards (1989), the NCTM Assessment Standards for School Mathematics (1993) and the NCTM Professional Standards (1991). In addition, we plan to incorporate to the maximum extent possible (given our start-up with the middle school grades rather than elementary) the philosophy and goals of the University of Chicago Mathematics Project (UCSMP) if not their entire six year secondary curriculum. The QPS curriculum is in line with the NCTM Standards, so those QPS students currently working "at grade level" should be able to channel in to the UCSMP curriculum *Transition Mathematics and Algebra*, should we elect to adopt it. UCSMP is currently field-testing their *Geometry and Advanced Algebra* curriculum materials.

The approach taken by the NCTM involves three aspects of learning mathematics:

- problem solving, within both pure and applied mathematics
- communication, within the field and with others outside it
- reasoning, including both inductive and deductive approaches.

Zalman Uziskin of UCSMP states that "we need to (explore) the roles of assumptions, logic, definitions, theorems, and proof in an exploratory environment."

The UCSMP curriculum includes a fourth aspect (USCMP Newsletter Winter, 1993), which the founders of SCI C.S. find to be essential:

mathematics as procedures or algorithms.

Students should know how to identify and use existing algorithms to increase their efficiency in problem solving (e.g. finding the root of an equation or rewriting fractions as decimals), and they should also learn how to devise and document new ones.

This type of work is, of course, an essential part of being able to program a computer. It is also a useful skill to possess for virtually any organizational endeavor.

Our students will view mathematics as a normal and convenient way to communicate with others and be fluent in doing so. They will grow to understand that mathematical and scientific thinking provides a way of developing a world-view as an individual. This approach teaches objectivity as a means of arriving at truth, and as such is a values-driven form of education, which is secular, and grounded in the concept of advancement based upon merit.

We promote the use of calculators or computers when studying mathematical concepts. No student will be deterred from becoming mathematically successful by "math dyslexia" (e.g. accidental transposition of numbers). Drill of computational skills will play a key, albeit subordinate, role (see Assessment Standards for School Mathematics, NCTM, 1993).

The Quincy Student Centered Learning System Mathematics Curriculum and the SCLS Physical, Chemical, and Planetary Science Curriculum as established in September, 1978 contains much useful and relevant material that has been continuously updated, especially with respect to NCTM standards for mathematics. QPS has for several years had a highly successful, competitive student math teams many of whose members have been admitted to prestigious colleges and universities. As such, the existing and older QPS math curricula should provide a convenient and useful basis of departure for our SCI C.S.-specific curriculum.

Sample math project.

The following is an example of how a class could be organized to challenge themselves with a problem to solve. This activity would involve students at differing levels of mastery, and would be conducted in a smaller work room rather than a class room. The teacher present may be an assistant who has been guided by the master teacher. The assistant teacher would be supportive, maintain order, and he or she would NOT direct the students, but coach them if they they get are unable to proceed.

TASK: building a dog-pen

PRIMARY FOCUS: math procedures such as measurement, relationships of perimeters and area, limits, maxima & minima, and functions to described relationships.

GENERAL OBJECTIVES: Quantitative: understanding spatial relationships of geometric objects

NCTM OBJECTIVES: understanding perimeter and area and the relationships between them.

PRIOR PREPARATION: review of linear and spatial measurements and appropriate vocabulary.

INFORMATION NEEDED: formulas for areas and perimeters of polygons

TECHNIQUES: graphing, derivation of rules, alternating of variables, approximations.

SUGGESTED TOPICS FOR DISCUSSION:

Does the size of the dog matter?

Should the shape of the dog house determine the shape of the pen?

What is the most realistic shape for the pen?

Why are other shapes rarely used?

What would be the pros and cons of building a round pen, for the builder, and for the dog?

The founders of SCI C.S. believe that the current debate over both mathematics and science curricula in the U.S., while acknowledging that the U.S. is lagging in international standards and competitiveness, does not actually address how to go about changing this. Our faculty will be active in the contribution and/or review of information published on this topic. Our school will participate in international student exchange programs that will clearly demonstrate in a motivating way how much mathematics the foreign counterparts of our students know and can apply.

Humanities Curriculum

In this proposal "humanities" will include fields of study that might also be classified as "liberal arts". The choice of "humanities" serves the purpose of simplicity. It also reflects the curricular emphasis on certain key disciplines:

The humanities curriculum aims to provide students with the finest possible preparation in the subject areas offered. The commitment to humanities has a three-fold basis: 1) a belief that students preparing for college and professional careers in science, mathematics, or technology must have the knowledge and skills that result from studying and working in the humanities; 2) a belief that, irrespective of career choice, the knowledge and skills embodied in the humanities are essential to the definition of an educated person and a good life; 3) a recognition that secondary education must make a student intellectually free and practically able either to continue to advance on academic paths already chosen or to choose to follow new and different ones.

The approach to subject matter will retain and protect the integrity of the subject area, or in the terms of the Quincy SCLS, the curriculum will respect the "structures of the disciplines." For example, a work of literature will be studied as literature. Emphasis will be placed on mastering the ways of thinking, analyzing, and questioning that distinguish literary study and criticism and on appreciating the literary work in itself, in its relation to other literature and in its relation to the student's individual and our common human experience. Similarly, an historical event or period will be considered as history. Emphasis will be placed on ways of thinking that are characteristic of historical study, such as an interest in cause and effect, in understanding and appreciating historical sequence and placement, in evaluating kinds of evidence and adequacy of evidence. Once again the aim will be to understand the event or period itself, its historical context, and its relation to the student's individual and our common human experience.

In keeping with the school's science-and-mathematics orientation, the humanities curriculum will take appropriate opportunities to make connections with the fields of science, mathematics, and technology. These connections may be made in humanities courses or in interdisciplinary projects. One kind of connection would focus on the specific content of topics being studied. Clearly math, science, and technology all intertwine with history and expression throughout human experience. Students and teachers may therefore want to spend time on, for instance, the cosmologies of earlier times, Stalin's banning of Mendel's genetics, Darwin's voluntarily delaying publication of his theory of natural selection, the geology of Quincy hills and how the collision of the continents millions of years ago gave rise to the early economics of Quincy and the granite industry, the naturalist writers' interest in the scientific method. All students will complete a major project in the humanities before graduation.

The purpose of these interdisciplinary connections is to recognize the validity of each field of study in humanities and science, to identify congruences and divergences and to seek the achievements and limitations of each field. J. Bronowski stated:

"Science is a very human form of knowledge. We are always at the brink of the known, we always feel forward for what is to be hoped. Every judgment in science stands on the edge of error, and is personal. Science is a tribute to what we can know although we are fallible We have to cure ourselves of the itch for absolute knowledge and power. We have to close the distance between the push-button order, and the human act. We have to touch people." (J. Bronowski, "Knowledge or Certainty," *The Ascent of Man* (Boston: Little, Brown, 1974.)

The humanities curriculum in itself also seeks to create a bridge between ideas of education that are often mistakenly taken to be in opposition; notably the recognition that there be cultural literacy, a common core of knowledge and content, and the realization that education must address the development and experience of the individual student.

The humanities curriculum concentrates on three key subject areas because we believe that in-depth mastery of the knowledge and skills characteristic of these areas is crucial for an educated person and that such mastery makes possible and facilitates mastery of other subject areas in the humanities and social sciences.

Precise curriculum requirements will accord with the emerging **Massachusetts Common Core of Learning and Curriculum Frameworks**. **Precise** curriculum formulations also await the formation of the SCI core faculty. The main curriculum guidelines are offered here.

English

The overall goals of the English curriculum are that students:

1. Be able to write and speak formal English effectively and be able to compose cogent discursive, analytic and argumentative essays.

2. Be able to identify the elements of English grammar and syntax and be able to analyze written and spoken English in terms of grammar and syntax.
3. Be able to appreciate and analyze works of poetry, fiction, drama, and discursive prose.
4. Know a select number of major works of English and American literature in depth.
5. Be familiar with the history and recognize the major works and figures of English and American literature.
6. Be familiar with key works of world literature.
7. Have some experience in composing fiction, drama, or poetry.

In the earliest phases, major attention will be given to the students' mastery of formal English, to their basic composition skills, and to their ability to comprehend increasingly complex works of literature and increasingly to understand literary works as part of a cultural continuum. The ability to work with small groups and to individualize task and test performances permits the instruction of traditional content in a manner that allows the students' skills and confidence to develop. Essay subjects will increasingly link to the subject matter of readings and increasingly call upon analytic skills. By working in various-sized groups, students will also develop their public speaking skills.

Readings, as in the QPS, will rely on primary texts. Selections will be made on the basis of literary value and reputation. They will be appropriate both to the intellectual level and emotional development of younger students. At the same time effort will be made to mix not the quality but the kinds of subjects and kinds of narratives. Particular emphasis will be given to reading extended prose works as well as short stories and anthology selections. Emphasis will also be given to poetry so that students become comfortable with this medium. Later the discussion looks more towards formal properties and types of literature, providing a basic grounding in such concepts as the adventure, comedy, tragedy.

When all students have mastered the most complex grammatical and syntactical analysis and are capable of composing a fluid, coherent essay on an objective topic, they are ready to master the basics of a research paper. From here on literature study becomes more rigorous and systematic. A "great authors" syllabus would represent fiction, poetry, and drama; and should represent several time periods and include both English and American works. Students become comfortably grounded in basics of formal meter and versification.

Subsequent components explore key works that underlie much other writing and culture: eg. Bible stories as literature, Homer, Dante; and survey English and American literature. Throughout, students have ample opportunity to encounter the works of "Standard" authors, including Shakespeare both for their historic and cultural importance and their continuing relevance. Students also explore works of literature by authors not always contained in the standard canon. Students write

regularly and hone analytic skills. Student writing is also integrated with work in other disciplines in an-across-the-curriculum approach.

In the most advanced phases students focus on tragedy and comedy as fundamental ways of viewing human experience, and explore major works of modern and world literature.

History Curriculum

Goals of the History curriculum are that students:

1. Know the outline and the major events of the political, economic, cultural, and scientific development of Europe and the U.S.
2. Be familiar with ancient history and pre-history.
3. Be familiar with history of non-Western and pre-conquest Latin American indigenous cultures. (The history of post-conquest Latin-America is presently conceived as a component of the Spanish curriculum.)
4. Understand and be able to apply methods of historical analysis.
5. Be able to recognize, and formulate and express, informed opinions on the ethical problems arising in human history.

The curriculum's approach to history includes geography, basic economics. The initial stages of study emphasize a basic grounding in major historical events, the development of major institutions, the diversity of human history, and the continuation of history from pre-history onwards. Specific areas include American History, geography, and government non-Western and indigenous American Cultures, ancient history and cultures; the medieval world.

As studies progress, the emphasis steadily broadens and deepens from simply what happened to why it happened. Students are introduced to the basics of historiography, historical analysis, and theories of history. Through work on specific examples, students become familiar with induction and drawing inferences, and methods of research. Students will analyze earlier written histories, examine documents and use demographic and economic analysis along with applied science.

The most advanced stages are investigations of the U.S. and Europe beginning with the European renaissance. This includes all major cultural aspects of historical study, for example, intellectual history, the scientific revolution, religion, economics and government, the rise of democracy, imperialism, 20th century totalitarianism and the impact of the world wars. Historical aspects of the debate on structure and access to education for the public will be covered, particularly as it reflects such founders of the U.S. as Jefferson and Adams. The curriculum will

address such problems of the modern world as energy, the global economy, and problems of sustainable development.

Students will be encouraged to perform public service such as internships in any level of government, local, state, or national during the summer months. A report on the nature of this public service experience may constitute a major project.

Foreign Language

SCI will begin by offering Spanish. It makes this choice in light of Spanish's increasing importance as a language within the United States and as a medium of commerce and literature. The language has historical and current relevance to the history of North America and the present and future representation of Hispanic people and culture in U.S. culture. As a Romance language, Spanish has a grammar and vocabulary whose accessibility for most Americans makes it an attractive starting point. Finally, the reality of the increasing economic and cultural ties between the United States and all of Latin America make Spanish a pragmatic choice.

SCI. C.S. recognizes the importance of offering multiple languages. With the development of the school, we will seek to introduce French and Latin and at least one Asian language.

Overall goals of the Spanish Curriculum are to allow students:

1. to speak, read, and write Spanish fluently;
2. to develop a knowledge and appreciation of Spanish-language literature;
3. to recognize that a relation exists between the history of a language other kinds of history.

At the beginning level emphasis would be on conversation, with early introduction of real-life reading samples. These could include classics of Spanish-language juvenile literature such as "Ferdinand", and excerpts from contemporary age-appropriate journalism.

Following a phase-in of formal grammar instruction upper level students would have extensive training in grammar, vocabulary, and conversation, with a concomitant increase in complexity of real-life reading samples. The most advanced students who want to go further will combine most advanced grammar levels with readings in Spanish-language literature and culture. Literature readings should make students familiar with Don Quixote as a seminal work for all western culture, and they should include twentieth-century Latin American as well as classic Spanish writers.

The study of Spanish language is accompanied by an introduction to the history and culture of the Hispanic world. This study would include Spain itself, the Spanish-speaking cultures of the Americas and elsewhere, and the role of Hispanic culture within the United States.

Possibilities for interdisciplinary work apply here as in other fields of study. Students may choose to link language, political theory, and technology by exploring the claim that the Spanish Civil War was "a dress rehearsal for World War II."

Athletics Program

We feel that Martial Arts such as Karate can replace the traditional physical education and was chosen for SCI C.S. because there is clear evidence that such training helps self discipline and concentration. The sport embodies the tradition of advancement and recognition based on mastery. True mastery is often achieved only when a student can teach someone else.

The Athletics Program at SCI C.S. is centered in the martial art of Karate for several reasons. First, it embodies two of the three key elements of our academic program: self-paced learning and cooperative effort. Students progress at their own individual pace, but the group practices (drills) together and meditates together. The entire school comprises a team, any of whose members may compete at their individual rank in tournament. The choice of karate for the physically fit and even some disabled students, and the related discipline of Tai chi chuan (T'ai chi) for those who may have medical restrictions, provides another important cultural/historical context to our program of study, that of the oriental philosophy of respect for authority and the rights of others, and self-discipline.

Impulse control may become increasingly elusive for adolescents in middle school and beyond. The form of meditation practiced in the Shao Lin karate offered at SCI C.S. is not spiritual meditation as practiced in religion or in yoga. Instead, it mainly involves learning and practicing breathing techniques to enable the student to gain and maintain control of their emotional state and stay calm in any situation that may be either physically or emotionally threatening. This confers a certain poise that is an important contributor to the development of self-confidence and personal image.

One of the most difficult things to establish at the middle school and upper grades is acceptance by an older student that a younger one may do something better. In karate, the mentoring of one student by another more technically competent one, without regard for age is an established feature of the sport. As we regroup our students in the academic program based on mastery, the karate program will provide the model and the culture within which this can be more readily accomplished. Achievement in the karate program is marked by the conferring of colored belts. For example, white belt indicates "novice", brown belt indicates advanced rank, whereas black belt is used for

expert proficiency. One must achieve and demonstrate publicly the required set of "kata" (technical, dance-like movements) for each belt.

We recognize that some students who view varsity sports as their route to college admission and possibly scholarship will not find their needs met in our school even if the academic program is attractive to them. As we grow, we will consider adding in other more standard sports to our athletic program. In the early years, any sports activity beyond that outlined above will be coordinated and coached by parent and community volunteers.

11.)STUDENT PERFORMANCE

Student Assessments

Our view of assessing students encompasses both the traditional as well as the innovative. We believe that SCI C.S. should be able to do both well.

The QPS Director of Information Services, Arthur Woodward stated in his summary report of November, 1986 that both Quincy SCLS curriculum-specific criterion- referenced tests as well as norm-referenced tests will continue to be useful for evaluation of student progress. Even more recently, the UCSMP Director Zalman Usiskin says "Let us drop this overstated rhetoric about all the old tests being bad. Those tests were used because they are quite effective in fitting a particular mathematical model of performance- a single number that has some value to predict future performance. Until it can be shown that the alternative assessment techniques do a better job at prediction, let us not knock what is there. The mathematics education community has forgotten that it is poor performance on the old tests that rallied the public behind our desire to change. We cannot very well pick up the banner, but then say the tests are no measure of performance. We cannot have it both ways." (UCSMP Newsletter, Winter, 1993).

In fact, the NCTM Assessment Standards (October, 1993) are still in draft form and circulating for public comment. Presently, it centers on performance standards, with detailed work on tasks, scoring procedures, and reporting procedures apparently still to come. Accordingly, the SCI C.S. assessment of student performance will include but not be limited to standardized, norm-referenced tests, SCI C.S. curriculum- specific criterion-referenced tests which will reference the QPS numerical curriculum system wherever possible, and the multiple-choice testing format will also be employed. Our teachers will be encouraged to experiment with the structure of multiple choice tests to go beyond the level of simple recognition, to reflect such parameters as the student's ability to use two or more discrete principles to predict an outcome, or the student's ability to choose a logical strategy of answering a

multistep problem, especially where this may involve recognizing the appropriate use of algorithms that have been taught.

SCI C.S. faculty will follow closely and participate, if possible, in the Massachusetts Commission on the Common Core of Learning project. We will seek to inform ourselves about the organized structure used by the Educational Testing Service to evaluate Advanced Placement Exams that involve problem solving and essays. We will inform ourselves of similar advances in portfolio evaluation as they emerge, and endeavor to become contributors to that field. To the degree that computerized artificial intelligence is increasingly capable of analyzing the structure and syntax of written English, we will pursue the possibility of this application as well.

Teacher Assessments

More formal methods of assessment may be developed as SCI C.S. grows in size and sophistication, and has gained enough experience with this model of a school to be able to begin deriving additional principles that contribute to its success. Students and parents will be offered the opportunity to participate in the formulation of the assessment tools used to evaluate both individual teachers, specific programs, the individual disciplines, and the school environment as a whole.

Faculty as well as administration will be evaluated on a regular basis. It is our belief, that feedback is a necessary although difficult part of professional growth. We plan to use a peer evaluation system to promote formative evaluation, and to establish a more administrative method for the purpose of summative feedback and decision making.

During the first three years of the life of SCI C.S., the assessment of teachers will consist primarily of self-assessment through group planning and evaluation meetings of the comparatively small faculty. The type of questions they will be asked to use to evaluate themselves may include the following:

I feel well-prepared to:

- manage a class of students who are using manipulatives.**
- manage a class of students who are all working on different projects**
- guide and evaluate student projects in which I do not know all of the answers and must rely upon a colleague or the student to provide or discover some of them.**
- use the curriculum as a guide to individualization of lesson plans for the group**
- use the curriculum as a support and reference point in the prescriptive remediation of individual deficits in knowledge (identify in a given student.**
- use text-books as a resources rather than as the primary instructional tool.**

phrase questions to encourage more open-ended investigations.
encourage the asking of questions to which there is no known answer.

use calculators as an integral part of math instruction.

use computers as an integral part of math and science instruction.

use statistical and other mathematical methods as an integral part of science instruction.

The aspects of teaching to be assessed:

Pedagogy

do the lesson plans, lecture, lab or discussion materials and presentation evidence adequate preparation?

is the teacher knowledgeable about alternative methods of presentation?

does the teacher convey material clearly and succinctly?

are the examples chosen to illustrate facts and principles appropriate to the level of understanding and interests of the students?

are concrete examples given in sufficient abundance to allow students to generalize underlying principles? How is this evidenced?

are children stimulated to participate in the discussion and ask questions?

do the answers truly address the question asked and illuminate it?

does the method and content presented stimulate interest on the part of students? If so, how is this evidenced?

do students still seem interested when the lesson is complete?

is there some evidence of students grasp or mastery of concepts presented?

do students receive acknowledgment of their evidence of understanding?

do students receive praise for their mastery of material and thoughtful asking of questions?

are students asked to explain or figure out how the information presented or discovered can be used in a practical way?

Attitudes

While teaching does the teacher:

seem at ease and in command of material presented if lecturing, or apply direction and guidance at key points to keep discussion or projects on track without unduly influencing them?

call on or draw out female, male and minority and white students in relative proportion to their representation in the class

evidence a system of values and judgement in keeping with the philosophy and mission of the school (cite examples)

encourage students to question or challenge concepts?
encourage students to pursue their interests?
encourage students to share their knowledge and insights with one another when this is appropriate?
recognize sharing as often as competitive success?

Knowledge

do the lesson plans, lecture, lab, or discussion material and topic evidence in-depth grasp of the subject presented?
can the teacher answer most questions asked by student?
does the teacher recognize when they do not know all elements needed to give a complete answer to a question?
does the teacher explain to the student how to go about finding the answer out so the student can research it?
does the teacher acknowledge when she or he does not know the answer, modeling that it is ok not to know everything?
does the teacher recognize when a question is asked to which the answer is not known or is a topic of current research?

12.) SCHOOL EVALUATION

One of the advantages a charter school has is the accountability built in by the degree of support the community shows toward the school. Parents can vote "with their feet". Success will be measured by retention and the ability of SCI. C.S. to grow as planned and to attract successful students and adequate funding for the program.

The founders plan to engage the New England Association of Schools and Colleges in a discussion about how a charter school can become a member. Currently a section of NEAS&C is devoted to independent schools. It may be possible for SCI. C.S. to become accredited by NEAS&C. If this is possible, then the founders intend to apply, and to go through the association's extensive evaluation process.

The Charter school section of the school reform act, also sets accountabilities for reporting to the Secretary of Education. SCI. C.S. will comply with this process as defined by the secretary's office.

School evaluation is an important aspect of our school mission, and although SCI. C.S. intends to pursue the above evaluation methods, we also intend to develop a detailed self evaluation process which is described below.

Evaluation Criteria

Evaluation of the school should seek to determine whether and how the mission and core values are embodied in daily functions and decisions made by staff and students. A sample of questions which would be appropriate for use in the determination degree of success follows:

Is there clear evidence in the system of acknowledgment and rewards that merit plays the major role? List several examples (concrete cases) in each section, give the approximate proportion of total cases in which this is true

- in student promotion
- in teacher hiring and promotion
- in choice of administrators
- in election of the board of trustees

Which aspects of the organizational structure reflect the expectation of an academic work ethic?

-cite examples from demeanor and comportment of students, faculty, staff, and parental involvement

Identify any aspect of the organizational structure, daily function, including demeanor and comportment of any segment of the school population that may serve to undermine or detract from merit or academic work-ethic as a philosophy and style of implementation.

- Cite concrete examples in support of this contention.
- Advance suggestions that could serve to eliminate or minimize the problem (be specific).
- Estimate the cost involved in your suggestion, and describe any other organizational effort needed to fix the problem

How are the core values of self-paced learning, cooperation and independent

inquiry evidenced in:

daily interactions among students, faculty, staff, and parents in organizational matters (list examples).

What changes in fulfilling our duties and talking about them would better reflect the core values?

Does the program of study as written reflect the curriculum

- in a broad sense?
- in narrow terms?
- in sequence?
- completely?

Do indications of mastery by the students reflect appropriateness of level of the curriculum (behaviorally and with respect to structure of the discipline)? appropriate placement of individual students in master-grouped cohorts?

Do results of criterion-referenced and norm-referenced tests yield

- comparable results?
- for individual students?
- for mastery-grouped cohorts?

Do indications of mastery by the students reflect appropriateness of level (behaviorally and with respect to structure of the discipline)?

Do students readily use principles and examples from one discipline to answer questions, find solutions to problems, or explain outcomes of experiments?

What evidence indicates that students are able to carry over and/or apply principles of one pure discipline to another
are analogies logical?
are arguments rational?
are they factually correct?

SCI. C.S. will use these and additional (yet to be determined) criteria to evaluate the effectiveness of the program in carrying out the schools mission. The faculty evaluation of the school will be submitted to the board of directors who will include a summary in the annual report to the parents and community as required by law.

13.) HUMAN RESOURCE INFORMATION

FACULTY

Faculty will be chosen for their experience and academic background as well as their sharing of the mission and philosophy of SCI. C.S. It is hoped that, teachers who are interested in experiment and innovation, who value the "life of the mind" and who wish to be empowered to practise their profession in collaboration with other like minded individuals will be attracted to SCI. C.S.. Educational policy decisions and procedures will not be decided without the full collaboration of the faculty.

SCI. C.S. is an equal opportunity, affirmative employer and will not discriminate in the hiring of faculty and staff.

The modeling of a life in science or mathematics is one of the main reasons why our master teachers are expected to have done graduate or post-graduate study and/or work in the field they teach or a closely related one, or clearly demonstrate the aptitude for doing so, as a prerequisite for their employment at SCI C.S.

We further believe that it will be generally less expensive for society to pay scientists or other professionals who are also educators to teach in public school or to educate professionals to be educators than to educate educators to become professionals. This is why there will be no requirement at SCI C.S. that our master teachers be certified. We will seek out scientists who have already demonstrated that they can teach well. We may also hire some professional teachers who have clearly demonstrated that they think, speak, and teach scientifically, without regard to whether or not they are certified.

SCI. C.S. will also recruit part time faculty who may or may not make teaching their primary career, but who have special expertise needed to support the central program. Teacher Aides will be hired on a full or part time basis to supplement the academic program.

We hope to establish a positive relationship with the educators in Quincy and surrounding towns, and to be able to participate in and host workshops or other programs given for the public school teachers.

As we have stated, SCI C.S. wants to be a laboratory school in which new approaches to education are tried and evaluated. We anticipate frequent visits from others who want to learn from our experiences. This should help keep excitement and enthusiasm in our professional lives.

Money will be budgeted for teachers to attend conferences. Release time will be readily available for teachers to participate in a wide variety of ways in the national educational discussion. We expect to fundraise to provide money to support teachers who want to take courses, travel, or otherwise enrich their minds and kindle new sparks.

14.)GOVERNANCE

During the **application stage** and during the first three years of operation the **board** will consist of 10 original founders. The founders will be **responsible** for the governance and for carrying out the mission vision of SCI. C.S. as defined herein and in the charter. The founding board will have all authority for governance as established in section 89, paragraph 7 of the Massachusetts School Reform Act of 1993. The founders will work to establish the school, to govern the school during the first three years of operation, and to hire the first director. In addition, the founding board will produce a set of bylaws based on the guidelines set forth in the original charter and will establish the school as a nonprofit entity in Massachusetts. These bylaws will become the legal rules for the governance of SCI. C.S.

Ultimately, The governing body for SCI. C.S. will be a board of directors consisting of 15 members. Five will be elected from the parent body, five from the faculty or administration, and five will be selected by the board as a whole. These five will be chosen from leaders in the larger community who demonstrate a willingness to support and to contribute in a significant way to the leadership of SCI. C.S.

Before or during the third year of operation, the founding board will manage the transition into the 15 member board as constituted above. After the third year, the democratically elected board will take over the governance of SCI. C.S.. The founders will hold ex-officio or actual membership on the board as long as they wish to stay involved. Those who wish to be active voting members must be elected according to the principles stated above.

Once the permanent board is established (by no later than the end of the 3rd. year), members may serve 2 or 3 year terms, no more than 7 board members will serve 3 year terms during any given year. Elections for open positions on the board will be held in May or June of each school year at which time a meeting open to all members of the school community will be held to elect persons to fill vacancies. During that meeting a report on the current state of the school will be presented to those who attend.

The director (Chief Administrative Officer) of the school will also serve on the board as a fully voting member with the exception that he or she will be excluded from voting when there is a clear conflict of interest between the director and the board (e.g. salary). All board meetings will be open, and executive sessions which exclude members of the community shall not be allowed. The board will have the sole responsibility for changing the mission, hiring the director, producing the annual report to the secretary of education and the parents, and insuring the financial stability of SCI. C.S.

SCI. C.S. will work to establish partnerships with the greater Quincy community. We feel that many community groups will be interested in participating and supporting the founding of SCI. C.S.. It is our intent to reach out to business and industry to discover how we can better prepare our students for entering the work force of our community. We feel that we can demonstrate our ability to provide effective educational methods and as a result they will be willing to support is in our efforts. The private sector may also help provide us with resources and talent for many of our programs

Teachers will be empowered help run the school and to collaborate in a truly supportive and collegial atmosphere. The administration will meet frequently with faculty, and will involve them in all decisions which effect the educational environment of the school. Many duties and responsibilities such as admissions will be delegated to members of the faculty.

Parents will be an important part of the school community, and their participation is vital to its success. We intend for the school to serve as a meeting place and resource for our families during times when school programs are not using the space. Parents are expected to attend teacher conferences, and to be informed about school activities and the progress of their child. Such conferences will be scheduled in such a

way that reflects the work obligation of parents. This will involve some evening or weekend hours for staff.

SCI. C.S. will be a community in which the students participate. We will have meaningful ways that students can participate in decision making. We wish to foster the democratic principles our country is founded on, and therefore we will provide meaningful ways for them to participate. As a small close-knit community that values respect and courtesy, students will feel supported in self expression and participation in the school community. SCI. C.S. will have frequent community meetings where students, faculty, and administration will communicate their concerns to one another.

15.) BUILDING OPTIONS

There are several vacant industrial spaces in the downtown Quincy area. There are also several other vacant locations near the center of Quincy such as the old Patriot Ledger Building and the Grossmans building. Realistically we would most likely lease an appropriate space for the first three year, and then as SCI. C.S. reaches its full enrollment, we would move to a location where we could either build, or renovate a space which would ideally suit our specific programmatic needs. The founders feel that it is too soon in the process to contact realtors about suitable locations. In the event this charter receives support, we will immediately visit locations, and familiarize ourselves with the specific code requirements a school space would need to satisfy.

The building of the future is envisioned to consist of 26 classrooms sized rooms, a resource center, library, and a large common multi-use room. We plan to adhere to a ratio of 15 students to one teacher, so our rooms would be somewhat smaller than those found in the average public school. Some class rooms would have conventional arrangements, but many would be rooms containing educational materials on the perimeters, and large round tables for group work in the center. Computers which are networked, and full of resources would abound. Much of our fundraising activity would be dedicated to acquisition of computer hardware and software. Some rooms would have cubicles for students to use during study time. There would also be many small conference rooms where tutoring of small groups would take place.

Due to our interest in science and the environment, ideally the school would be spread out, with the activity rooms opening to the outside, with plenty of windows to let in the surroundings. The lot should be large enough to have landscaping, and reproductions of natural ecosystems in various corners. We plan to locate within easy walking distance of public transportation, and with easy access to Rt. 128 and Rt. 3/93. This would allow parents from other south coastal communities to drop off and pick up their children as they commute to work. A choice of location will need to reflect suitable parking for faculty, staff, and students who drive and park at the school.

We would incorporate the most cost effective methods for passive solar heating or cooling, and where feasible incorporate new technologies to increase efficiency and reduce maintainance costs. Whenever possible, sensing and monitoring of these systems would be installed so that the

school itself can be used as a laboratory by students. South facing walls would have many windows, and interior spaces would be made available for plant growth.

The larger classrooms would be more central as would the large common room. These would ideally clustered around a large atrium in the center of the building. This atrium could possibly be covered in the winter with an inflatable transparent dome. This could be an attractive space for groups to meet and work together informally.

A visitor entering the building would, at first glance, believe this to be a conventional public school. They would see some classrooms with students sitting at desks listening to and asking questions of a lecturer. As the visitor continued down the hallway, searching for the main office, only rooms with equipment, books, and computers at the perimeter, and large tables at the center, cluttered with assortments of tools, papers, and books, come into view. Some rooms are occupied by a variety of students who seem actively engaged in building a wooden structure. A group of girls and boys is present, some hammering boisterously, others poring over blueprints and columns of numbers. The teacher is engaged in quiet conversation with one of the students. The view out the window shows scattered pines and maple trees. Under the trees the soil is covered with leaf litter, and trilliums are in blossom.

Further down the hall you discover a large white room, where white robed students are working with their Karate instructor. Then you pass through to the atrium. The sun is shining, and clusters of students are sitting on benches eating their lunch. Some are playing chess. You still haven't found the school office because it is tucked away on the back on the second floor.

You remark that no one seems to be in charge, yet everything is running smoothly. Everyone is polite, they inquire if they can help you, and the atmosphere is comfortable, relaxed, yet there is a tension of concentrated activity in the air. You conclude that this not a conventional public school after all.

Educational PHILOSOPHY supporting the MISSION

The most current debate about educational reform in the United States has its origin with the Nation at Risk report produced by the then Secretary of Education William Bennett in 1983. For the past decade, American educators have been actively engaged on the identification of the problems, and what should be done to cure them. In the mean time, there has been little or no changes in the way public schools operate, and little indication of an overall improvement in school performance. Massachusetts has gone from 25th to 49th place on the national measure of state support for public education. Growing public impatience with the lack of progress in educational reform has produced initiatives for voucher systems, and more recently charter schools.

In order to gain some perspective on this debate, it is useful to know the history of the educational debate during the past century. According to Kliebard (*The Struggle for the American Curriculum*.) there are actually four major themes. The first was the classical approach proposed by Eliot, the second was developmental as proposed by G. Stanley Hall. The third was the social efficiency model which prepared workers to be worthwhile citizens. Most recently the school was viewed as a place to promote social change. Powell, Farrar, and Cohen (*The Shopping Mall High School*, 1985.) Point out the long history of "accommodations" or "treaties" which have been made by the secondary schools to solve the social problems of our youth, and to meet the "nature and needs" of the students. Powell also points out assumptions that most students were "incapable" of doing traditional academic work led schools to ease their academic demands or standards.

Since 1890 there has been no clear consensus about curriculum with schools generally offering a wide variety of subjects but no standard, required core of subjects. The social efficiency school has produced schools which are viewed as a factory or work place. A goal statement of the QPS (1967) stated "The development of individuals who are maximally competent: 1. as self-fulfilling individuals, 2. as citizens, 3. as workers" still reflected the importance of student becoming a worker. In this kind of school students are in an industrial arts or college curriculum where the subject matter is "atomized" into discrete subject areas. Administration is top down and authoritarian. *A Nation at Risk* did not recognize the fundamental structural problems in public schools. Instead *A Nation at Risk* simply recapitulated the late 1800's debate between Charles Eliot and Herman Hall.

Today's successful school must address varied learning styles and the needs of a diverse student population. Unfortunately, *A Nation at Risk* fails to address the lack of political support for taxes to support better education. Today's "comprehensive" or "shopping mall" high school tries to do all things for all students regardless of what their special abilities or needs are. We believe that when a school tries to do everything for all students, and it tries to correct the ills of society, it usually doesn't do anything very well.

Now more than a decade later, the focus is on what makes school work better, and on performance based educational programs which hold the schools responsible for the outcomes. Our mission and design carefully incorporates and reflects the discoveries of recent educational research and incorporates the ideas of such reform minded people as Howard Gardner, Robert Reich, Albert Shanker and TheodoreSizer.

The concept of the charter school provides an intermediate option between the two extremes of voucher systems, where parents can use public money to send their children to any school they choose (John Chubb and Terry Moe (1990)) and the alternative of maintaining the status quo. The forces of "inertia" which resist change in the public schools and the larger social burdens currently placed on them, make them structurally unable to provide alternative learning opportunities for their students. On the other hand the voucher system has as its goal the forceful reform of public education by placing it in direct competition with existing private schools. Charter schools legislation gives the people of Massachusetts the opportunity to provide distinct alternatives without denigrating the efforts of the public schools while

still fostering innovation and experimentation with methods suggested by educational research and pioneering efforts such as those of the Coalition of Essential Schools. This more moderate approach helps educational reform, while keeping charter schools within the public sector and establishing accountabilities for student performance.

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Winn, Marie. "New Views of Human Intelligence". New York Times Magazine. Part 2. p. 28. April 29, 1990

APPENDIX

Peter Burleigh
222 Rock Island Rd.
Quincy, MA 02169
(617) 472-4498
January 1994

EXPERIENCE:

- Adjunct Faculty,** Quincy College.
Computer Science.(Introduction, FORTRAN, DBASE IV), Biology
34 Coddington St., Quincy MA 02169
- Headmaster,** Lexington Montessori School
195 students, preschool - grade 6. (CEO) for all school operations.
28 staff and faculty.\$1.3 Million budget
130 Pleasant St. 02173
- Klingenstein Fellow,** Teachers College, Columbia University,
Master of Arts Degree. (Full scholarship with full stipend)
- Administrative Dean** Thayer Academy, (11 yrs.)
Exemplary Co-ed Day School, 580 students grades 6-12
745 Washington St., Braintree, Massachusetts
- Chair, Science and Computer Department (9 yrs.)
Chair, Department Heads Group
Coordinator of all faculty committees
Director of NEAS&C re-accreditation process
Chair and Designer of faculty evaluation procedures
Director of faculty professional growth
Planner: \$2.5M Science/Math/Computer Complex
Redesign of computer center; strategic planning committee.
Chair: Academic Affairs Committee, Faculty Salary Committee
Editor of successful Exemplary Private School report
Budget management; hiring and faculty evaluation
System Administrator and Computer Coordinator
Author of A Computer Primer
Teacher: AP Computer, Biology, Geology, Marine Science
- Teacher** Herdman Collegiate School
Provincial High School, 1100 Students
English, science, Grades 10 and 11
Corner Brook, Newfoundland, CANADA;
- Teacher** Proctor Academy
Boarding School, Grades 9-12 275 students
Biology, science; Coach: skiing, sailing;
Dorm Duties; Development of Outward Bound program.
- Instructor** Univ. of Maine, Presque Isle
English Literature, 19th Poetry, and Creative Writing
- Teacher** Hopkington Public H.S.
7th & 8th Grade Math and Science, Biology.

RELATED EXPERIENCE

Vice Chair, Weymouth School Planning Subcommittee
 School Evaluator: 5 times a member of NEASC visitation teams
 Teacher Trainer, Museum of Science, Boston
 Program Planner, Secondary Science, NAIS National Conference
 Board Member/Treasurer, Montessori Schools of Mass.
 Consultant/member, Data Processing Board, Braintree, MA
 Judge, Mass. State Science Fair
 Multiple Professional Presentations: Marine Science, Computer Science, After the A.P., Computer Logic Labs, Data Bases
 Active Member of: Computer Coordinators, Friends of 2nd ICCE, ISAM
 Director of Summer Camp Village
 Law Enforcement, N.H. Dept. of Safety, Lake Patrol
 Chairman Religious Education Committee

ADDITIONAL INFORMATION

Born Franklin, N.H.
 Married with a son
 Travel Experience in: Peru, Guatemala, Mexico, Caribbean, Canada
 Designer and Builder of three Bedroom Home in Newfoundland
 Sailed extensively in New England Coastal Waters, Virgin Islands
 Photographs have been exhibited in several galleries
 Community theater: actor

I have good critical thinking and creative skills and I enjoy being challenged by new experiences and difficult problems.

EDUCATION

Columbia University	MA
Univ. Mass. at Boston	Ed. Admin.
Univ. of New Hampshire	Marine Science
Univ. of New Hampshire	English Literature
Univ. of Minnesota	Teaching Fellow (Botany & Biology)
Univ. of New Hampshire	BA (Botany, Geology)
Franklin High School, N.H.	Graduated

REFERENCES

William Elliott, Headmaster, Thayer Academy, 745 Washington St., Braintree, MA 02184 (W) 617 843-3580

Dr. Susan Campbell, Faculty, Quincy College, (H) 617 471-6831

Nancy Hartman, Director of Admissions, LMS, 130 Pleasant St. Lexington, MA 02173 (W) 617 862-8571 (H) 617 861-1181

Bruce Appleby, Board of Directors, LMS, 79 Montvale Ave, Woburn, MA (W) 617 860-6390 (H) 617 938-8633

Frederick R. Nagle, Dir. of Counseling, Thayer Academy (W) 617 843-3580

Others are available upon request.

SUSAN E. CAMPBELL
180 Furnace Brook Parkway, Quincy, MA 02169
(617) 471-6831 home

OBJECTIVES: the ideal position will involve a high level of responsibility in development and/or administration of programs, as well as related duties that may be managerial, administrative, educational, or financial.

EXPERIENCE:

- | | |
|--------------------------------------|---|
| o Program and project development | o Continuous Quality Improvement |
| o Public policy formation | o College, secondary, & adult education |
| o Proposal & report preparation | o Higher education administration |
| o Contract negotiation & preparation | o Training of technical assistants |
| o Budget preparation | o Supervision of technical staff |
| o Publication of scientific papers | o Curriculum analysis & development |
| o Basic scientific research; biology | o Program evaluation |
| o Applied scientific research | o Facilities design |
| o Public speaking | o Conference organization |
| o Computer expert system application | o Grant writing |
| o Epidemiology & Infection Control | o International representation |

EDUCATION & CERTIFICATION:

Certified Infection Control Practitioner, CBIC (national), 1992.
Certified Biology Teacher (9-12), Massachusetts, 1986.
Boston University: Ph.D. 1980; B.A. 1977 cum laude with distinction.
Kantonsspital Basel, Switzerland: R.N. 1974.

COMMUNITY SERVICE:

Educational Development Committee member, Quincy Public Schools appointee
Board Member, New England Friends of Croatia, Refugee Relief Organization
Environmental Impact Statement Volunteer reviewer, Quincy

EMPLOYMENT:

1993- : Faculty member (Microbiology and Biology), Quincy College, 74
Coddington St., Quincy, MA 02169.
1993- : Faculty member, (Anatomy and Physiology), Youville Hospital School
of Nursing, 1575 Cambridge St., Cambridge, MA 02138.
1992-1993: Infection Control Director. Youville Hosp., 1575 Cambridge St.,
Cambridge, MA 02138.
1991-1992: Infection Control Practitioner. Gaebler Children's Center, Waltham.
1990-1991: Infection Control Practitioner. Metropolitan State Hospital, Waltham.
1989-1990: Clinical Supervisor. Mass. Eye & Ear Infirmary, Boston.
1987-1990: Financial Consultant. Chestnut Hill Financial Group.
1987-1988: Adjunct Assistant Professor. Mass. College of Pharmacy, Boston.
1986-1987: Milton Public Schools. Biology Teacher.
1984-present: Bionova International. Sole proprietorship consulting, Quincy.
1980-1992: Boston University. Research Associate, Boston.
1984-1985: AAAS Science, Engineering, & Diplomacy Fellow, U.S. Agency for
International Development, Washington, D.C., Asia & Near East Bureau.
1984: U. Mass., Amherst. Staff Associate, On-Site Director, Adjunct Assistant
Professor of Boston Secondary Schools Project, School of Education.
1982-1983: Brookline Public Schools. Biology Teacher.
1982: Postdoc. Fellow, Nat. Academy of Science, Institut R. Boskovic, Croatia.
1981-1982: NATO Postdoctoral Fellow, University of Naples, Italy.
1981: U. Mass. Boston. Lecturer in General Microbiology.
1977-1980: Boston University. Graduate Teaching Assistant & Research Associate

Edward F. Fitzgerald

-2 Gilmore Street
Quincy, MA 02170
(617) 479-2732

Education

Ph.D., English, New York University, 1985.

Dissertation: "At Once Merry and Bitter": The Relation of Comic Incongruity to Character and Theme in the Works of Nathaniel Hawthorne.
Director: Kenneth Silverman.

M.A., English, New York University, 1971.

B.A., English, Brown University, 1969.

Professional Experience

Director, 1992-present: Quincy Historical Society, Quincy, MA.

Freelance Writer, 1991-present.

Articles submitted and in preparation. Consultant to Council on Aging, Sharon, MA; Trailside Museum, Milton, MA; Sage Productions, New York, NY.

Assistant Director of Communications, 1990; Assistant Director for Publications, 1988-9; Writer, 1986-7: The Lighthouse, New York, NY.

Chief writer for nationally-oriented human services and education agency. Wrote, edited, oversaw design and production of annual reports, newsletters, manuals, booklets, brochures, press materials. Wrote scripts and speeches for and coordinated public events. Ghost-wrote professional publications. Oversaw publications budget. Provided media relations for news coverage and feature stories. Contributed to video and multimedia projects and public-information campaigns. Administered national scholarship contest.

Visiting Lecturer, Humanities, 1975-85: Stevens Institute of Technology, Hoboken, NJ.

Taught Analysis of Ideas, Analysis of Literary Forms, American Short Story. Devised and taught humanities component of transition-to-college program for disadvantaged students. Helped found interdisciplinary writing tutorial.

Lecturer, Adjunct Lecturer, English, 1970-8: Queensborough Community College, Bayside, NY.

Taught English Composition, the Novel, Modern Literature, Introduction to Fiction, Introduction to Literature.

Coadjutant Instructor, English, 1974-5: Rutgers University Newark College, Newark, NJ.

Taught Literary Masterpieces since Renaissance, Introduction to Literature, English Composition.

Professional Experience (cont'd)

Consultant, 1978-85: Pocket Books, New American Library, Paramount Pictures, New York, NY.

Evaluated works for publishers and motion picture companies. Recommended for or against acquisition. Suggested directions for development. Top consultant at Pocket Books; on first-choice list at New American Library and Paramount. Recommended numerous best sellers, notable books, and successful films. Also worked regularly for Putnam, Book-of-the-Month Club, Markson Literary Agency, independent producers.

Publications

Look Out for Annie. The Lighthouse, 1986.
Thirty-minute video drama. Nationally distributed.

Reviews of journals in American literature. Serials Review, October, 1980.
Journals reviewed: New England Quarterly, Early American Literature, Southern Literary Journal, Western American Literature.

Contributing Editor. Canada, 1980, ed. Stephen Birnbaum. Houghton Mifflin, 1979.
Contributed chapters on Saskatchewan and Alberta.

Film reviews. Film Information. National Council of Churches, 1975-6.

"Society and the Man of Letters." In Matthew Arnold, Man of Letters, ed. William E. Buckler. University Microfilms, 1972.

References

Professor Kenneth Silverman, New York University.

Professor Robert Packard, Stevens Institute of Technology.

Norman Katz, Ph.D., Press Secretary, New York City Health and Hospitals Corp. (former Director of Communications and Public Affairs, The Lighthouse).

Professor William E. Buckler, late of New York University.

SOUTH COASTAL INSTITUTE CHARTER SCHOOL
FOUNDING COALITION
February 15, 1994

Organizing Founders

Mr. Peter Burleigh, Quincy parent, Quincy College Biology and Computer Science Instructor, former academy Dean and Headmaster (K-12) eligible for certification in MA. Doctoral candidate Columbia Teachers College.

Dr. Susan E. Campbell, Quincy parent, Quincy College Microbiology and Biology Instructor, MA certified former highschool science teacher, administrator, and research scientist. Appointed member Quincy Educational Development Committee (EDC)

Dr. Edward Fitzgerald, Quincy parent, Director Quincy Historical Society, former college professor of English, appointed member Quincy EDC, and president City-wide Parents Council Quincy.

Associates

Rev. Sheldon Bennett, Ph.D., Quincy parent, Minister First Parish Church Quincy, former college physics professor, construction manager and management consultant. Board member Woodward School for Girls

Ms. Mary Halpin-Carter, Charlestown resident, Director of Admissions Pengree School (independent multicultural school), historian and MA certified teacher.

Mr. Eugene Chikov, Milton parent, physicist and former mathematics teacher middle school through graduate school. Remote sensing engineer. Ph.D. candidate Moscow State University.

Ms. Carmen Karasic, Quincy parent, computer programmer and former MIS director Lotus Corp., former remedial and advanced college mathematics and computer programming teacher. Vice Chair and Board Member of multicultural highschool outreach dance program, Weston and Boston.

Mr. William Semple, Braintree resident, retired Thayer Academy math teacher and Navy commander.

Dr. Somnath Sengupta. Woburn parent. Quincy College Chemistry Instructor, Chemist U.S. Army Research Labs, Watertown, former MIT Research Fellow and college mathematics teacher.

Mr. Donald Spink. Weymouth parent. 5th degree karate blackbelt. owner and operator of "Master's Karate" Quincy Center, a school serving karate enthusiasts ages 4-70 for 14 years.

Supporters

Quincy

Ms. Deborah Beach, parent, RN

Mr. Howard Beach, parent, Microbiologist Braintree Hospital, Quincy College

Mrs. Rita Brutto, parent, Special Education Teacher

Ms. Paula Colin, parent, MA certified guidance counselor Boston

Ms. Norma Fitzgerald, parent, Director Council for Aging Sharon.

Mr. David Friedman, parent, graphic services technician Lotus Corp

Ms. Betsey Gilman, parent, pediatric occupational therapist

Mr. Rob Gilman, parent, owner & operator NE Weather Science, Quincy

Dr. Stjepko Golubic, parent, Boston University biology professor

Mr. William M. MacDonald, parent, engineer

Ms. Theresa A. Miller, parent, daycare provider, math major

Ms. Geri Montagna, parent

Mr. Peter Neely, parent, college placement counselor, English Teacher

Mrs. Kathy Neely, parent, chemistry teacher

Mr. David P. Karasic, parent, MA certified Vo-tech computer ed., Lotus Corp. Technical Support

Mr. George Nason, parent, electrician computers & fiber optics, NYNEX

Ms. Kathleen Nason, parent, Superfund hazardous waste manager Arthur D. Little

Dr. Bertrand N. Shaffer, parent, psychiatrist

Ms. Ingrid Shaffer, parent, public relations professional, writer & teacher

Ms. Donna Sullivan-Mock, parent, owner & operator Toddler Tech Preschool, North Quincy

Braintree

Mr. Alexander Shkarupag, former mathematics teacher, Moscow.

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

I/we believe that this school will provide a much-needed alternative to public school college preparatory education as it currently exists in Quincy, Milton, Weymouth, Braintree and other towns of the south shore Massachusetts region.

I/we consider this a well-formulated, meritorious proposal, written and organized by qualified individuals who are capable of establishing and operating such a school.

I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

John E. Dunleavy
Name

2/10/94
Date

[Signature]
Name

2/11/94
Date

Cambridge

Mr. Jeffrey Pray, parent, Software Engineer Lotus Corp., and
Owner & Operator of a Karate school in Cambridge.
Ms. Yvette Wells, parent, Technical Support Lotus Corp.

Dorchester

Mr. Winsor Lindor, parent, Configuration Engineer Lotus Corp.

Hingham

Mr. Robert Reynolds, Esq. resident. Boston attorney.

Milton

Ms. Elena Chikov, parent, Adjunct Professor of French Boston
University, former professor of French and German, Moscow

Pembroke

Ms. Elizabeth Murphy, parent, Technical Writer, Lotus Corp.

Weymouth

Ms. Deborah J. Doyle, parent
Mr. James T. Doyle, parent
Ms. Lucinda Morgan, parent, former founder, owner & operator
Toddler Tech Preschool N. Quincy, currently director of daycare
Plymouth
Mr. James Morgan, parent, owner & operator of trailer repair
Ms. Lisa Sailsman, parent
Mr. Ken Sailsman, parent

Plymouth

Mr. Edward Willwerth, parent, MA certified teacher, marine chemist

As we present this proposal on February 15, 1994, many other
endorsements are forthcoming but we will not be able to include
them.

ENDORSEMENT
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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publically funded Charter School.

William Andrew Shephard

Name

2-12-94

Date

Edward F. Fitzgerald

Name

2-12-94

Date

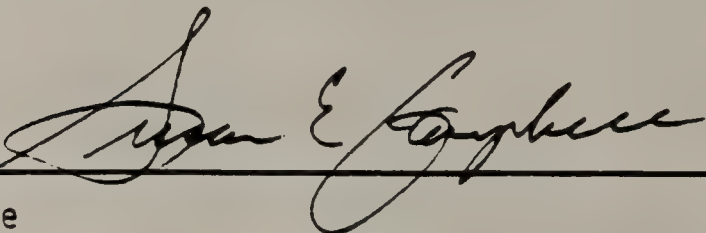
ENDORSEMENT
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a Science and Mathematics Charter School

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I/we believe that this school will provide a much-needed alternative to public school college preparatory education as it currently exists in Quincy, Milton, Weymouth, Braintree and other towns of the south shore Massachusetts region.

I/we consider this a well-formulated, meritorious proposal, written and organized by qualified individuals who are capable of establishing and operating such a school.

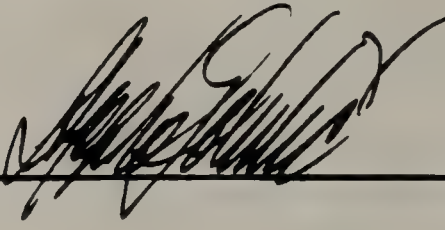
I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded, Charter School.



Name

2/12/94

Date



Name

2-12-94

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Maughan Carter
Name

Feb. 12, 1994
Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Rev. Sheldon B. Barnes, Ph.D.

Name

Feb 8, 1994

Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I do endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/~~we~~ consider this a well-formulated, meritorious proposal, written and organized by qualified individuals who are capable of establishing and operating such a school.

I/~~we~~ recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publically funded Charter School.

Sannata Sengupta

Name

02/14/94

Date _____

Name

Date _____

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Elena Chikov, Muf.
Name (mother & former
assistant professor
in Moscow college)
Muf.

2/10/94
Date

Father & professor
Name in State Moscow University
224 Adams str
Milton, MA, 02186

2/10/94
Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Deborah Beach

Name

2-8-94

Date

Howard Beach

Name

2-9-94

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Donald J. Spina

Name

2/7/94

Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Paula Cohen
Name

2/11/94
Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publically funded Charter School.

William M MacDonald
Name

February 12, 1994
Date

Rita Brutto
Name

February 13, 1994
Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Betsy Gilman
Name

2/13/94
Date

Bob Gil
Name

2/13/94
Date

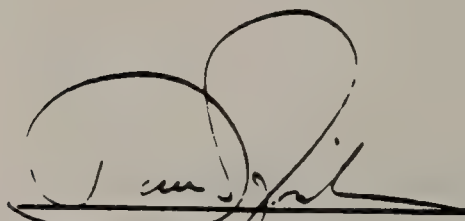
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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.


Name **DAVID FRIEDMAN**

2/10/94
Date

Name

Date

Parent & business professional - Quincy

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Thomas A. Miller
Name

Feb 10, 1994
Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Carmen Karasz
Name

2/10/94
Date

Daniel P. Karasz
Name

2/11/94
Date

Carmen Karasz
- Business Professional & Parent - Quincy

Dave Karasz
- Mass certified post-secondary voc-tech instr. -
- Tech. analyst & parent
- Quincy

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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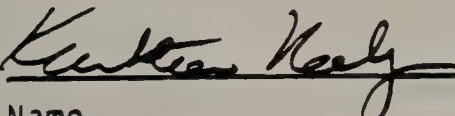
I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publically funded Charter School.



Name

2/14/94

Date



Name

2/15/94

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

 Eric S. Montoya
Name

 2/1/94
Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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Bert N. Shaffer, M.C.
Name

2/13/94
Date

Jim Shaffer
Name

2/13/94
Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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George C. Naron

Name

2/13/94

Date

ABNEEN HAN/ASON

Name

2/13/94

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

1. We endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

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Alimatax Phacoxis

Name _____

ER/10/94

Date _____

Name _____

Date _____

15-1 Skyline Drive,
Braintree, MA 02184

ENDORSEMENT
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Anna Sullivan-Mick
Name

2-8-94
Date

Name

Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Charles D. O'Brien
Name

2/10/94
Date

Name

Date

Business Professional & Parent
Cambridge / Somerville Line

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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Jeffrey Pray
Name JEFFREY PRAY

2/12/94
Date

Name

Date

Parent / Business Professional

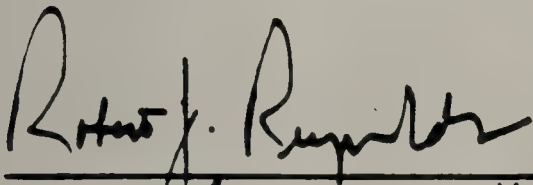
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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.



Name 11 Charter Street, Hingham, MA 02043
Atty @ 160 Federal Street, Boston, MA 02110

February 13, 1994

Date

Name

Date

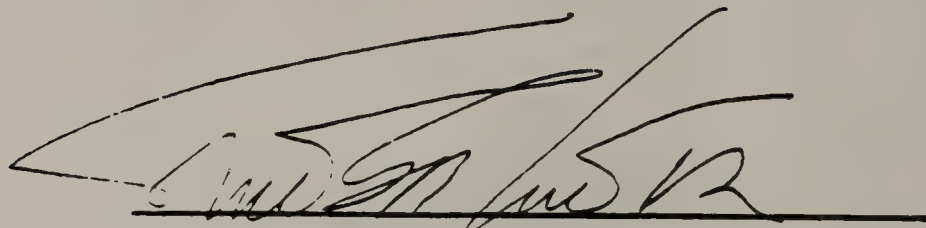
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Name LINDSOR WINSOR

2/10/94
Date

Name

Date

- Business Professional
- Parent (1 child)
- Dorchester

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Deborah J. Loyer
Name

2-8-94
Date

James I. Dafe
Name

2894
Date

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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I/we recommend that the Massachusetts State Department of Education extend a charter that would enable the founding of this school as a publicly funded Charter School.

Elizabeth D. Murphy
Name

2/10/94
Date

Name

Date

*parent and former Teacher and school librarian
Pembroke, Mass (resident)*

Bureau of...

ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

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Susan M. Sauloman
Name

2.8.94
Date

John Sauloman
Name

2.8.94
Date

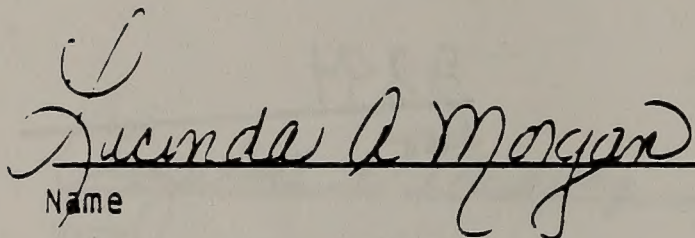
ENDORSEMENT
of the South Coastal Institute
a Science and Mathematics Charter School

I/we endorse the proposal for formation of the South Coastal Institute, a Science and Mathematics Charter School.

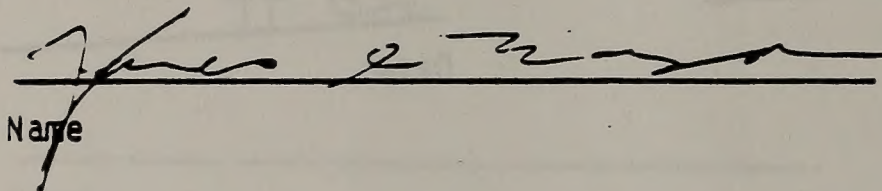
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Name

2-8-94
Date


Name

Feb 6, 94
Date

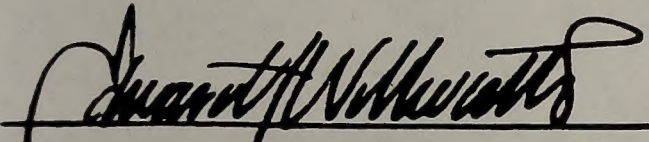
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Name **EDWARD J. WALLWERTH**

2/14/94
Date

Name

Date

